

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

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North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-69080-1

Client Project/Site: AK Steel-Stack Testing Quench Towers

For:

Environmental Quality Mgt., Inc.

1800 Carillon Blvd

Cincinnati, Ohio 45240

Attn: Ms. Jill Binzer



Authorized for release by:

9/26/2016 11:23:48 AM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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## Definitions/Glossary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Qualifiers

#### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

#### GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

#### GC/MS Semi VOA TICs

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

#### HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

#### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
dw	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

## Case Narrative

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Job ID: 240-69080-1**

**Laboratory: TestAmerica Canton**

Narrative

### CASE NARRATIVE

**Client: Environmental Quality Mgt., Inc.**

**Project: AK Steel-Stack Testing Quench Towers**

**Report Number: 240-69080-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The 610 PAH analysis was performed at the TestAmerica Nashville Laboratory. The 1613B Dioxin/Furans analysis was performed at the TestAmerica Knoxville Laboratory.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

#### **RECEIPT**

The samples were received on 9/3/2016 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.8° C and 1.4° C.

EXCEPT: Trip blank was listed on the COC; however, it was not reported per client request.

#### **VOLATILE ORGANIC COMPOUNDS (GCMS)**

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2), and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 09/09/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **SEMOVOLATILE ORGANIC COMPOUNDS (GCMS)**

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for semivolatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8270C. The samples were prepared on 09/06/2016 and analyzed on 09/07/2016.

## Case Narrative

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Job ID: 240-69080-1 (Continued)

#### Laboratory: TestAmerica Canton (Continued)

Surrogates are added during the extraction process prior to dilution. When the sample is diluted, surrogate recoveries are diluted out and no corrective action is required.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-245545.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for polycyclic aromatic hydrocarbons (PAHs) in accordance with EPA Method 610. The samples were prepared on 09/07/2016 and analyzed on 09/08/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### FORMALDEHYDE

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for formaldehyde in accordance with SW846 Method 8315A. The samples were prepared on 09/04/2016 and analyzed on 09/05/2016.

Formaldehyde was detected in method blank MB 240-245473/4-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-245473.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL RECOVERABLE METALS (ICP)

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for total recoverable metals (ICP) in accordance with EPA Method 200.7. The samples were prepared on 09/06/2016 and 09/08/2016 and analyzed on 09/08/2016 and 09/09/2016.

Beryllium was detected in method blank MB 240-246007/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### MERCURY

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for mercury in accordance with EPA Method 245.1. The samples were prepared on 09/06/2016 and analyzed on 09/07/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL DISSOLVED SOLIDS

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for total dissolved solids in accordance with SM 2540C. The samples were analyzed on 09/07/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### TOTAL CYANIDE

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3)

## Case Narrative

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Job ID: 240-69080-1 (Continued)

#### Laboratory: TestAmerica Canton (Continued)

were analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The samples were prepared and analyzed on 09/06/2016.

Cyanide, Total failed the recovery criteria low for the MS/MSD of sample 240-69088-2 and 240-69088-6 in batch 240-245689.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 240-245668 and analytical batch 240-245689 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **ANIONS**

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for anions in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/07/2016.

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1)[5X], DAY 3 Q2 (QUENCH 10) (240-69080-2)[5X] and DAY 3 Q3 (QUENCH 20) (240-69080-3)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **SULFIDE**

Samples DAY 3 Q1 (QUENCH 1) (240-69080-1), DAY 3 Q2 (QUENCH 10) (240-69080-2) and DAY 3 Q3 (QUENCH 20) (240-69080-3) were analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 09/06/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 245602.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Method Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
610	PAHs (HPLC)	40CFR136A	TAL NSH
8315A	Carbonyl Compounds by HPLC	SW846	TAL CAN
200.7 Rev 4.4	Metals (ICP)	EPA	TAL CAN
245.1	Mercury (CVAA)	EPA	TAL CAN
4500 S2 F-2000	Sulfide, Total	SM	TAL CAN
9012B	Cyanide, Total andor Amenable	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CAN

### Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

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## Sample Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-69080-1	DAY 3 Q1 (QUENCH 1)	Water	09/01/16 10:30	09/03/16 09:30
240-69080-2	DAY 3 Q2 (QUENCH 10)	Water	09/01/16 13:00	09/03/16 09:30
240-69080-3	DAY 3 Q3 (QUENCH 20)	Water	09/01/16 16:20	09/03/16 09:30

## Detection Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Client Sample ID: DAY 3 Q1 (QUENCH 1)

### Lab Sample ID: 240-69080-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.19		0.19	0.041	ug/L	1	8270C		Total/NA
Benzo[a]anthracene	0.35		0.19	0.055	ug/L	1	8270C		Total/NA
Benzo[b]fluoranthene	0.59		0.19	0.055	ug/L	1	8270C		Total/NA
Benzo[k]fluoranthene	0.28		0.19	0.044	ug/L	1	8270C		Total/NA
Benzo[g,h,i]perylene	0.36		0.19	0.046	ug/L	1	8270C		Total/NA
Benzo[a]pyrene	0.43		0.19	0.028	ug/L	1	8270C		Total/NA
Chrysene	0.44		0.19	0.032	ug/L	1	8270C		Total/NA
Fluoranthene	0.57		0.19	0.025	ug/L	1	8270C		Total/NA
Indeno[1,2,3-cd]pyrene	0.30		0.19	0.044	ug/L	1	8270C		Total/NA
Naphthalene	0.19		0.19	0.040	ug/L	1	8270C		Total/NA
Phenanthrene	0.46		0.19	0.029	ug/L	1	8270C		Total/NA
Pyrene	0.48		0.19	0.026	ug/L	1	8270C		Total/NA
Acenaphthene	0.38 J p		0.93	0.16	ug/L	1	610		Total/NA
Anthracene	0.12 J p		0.93	0.093	ug/L	1	610		Total/NA
Benzo[a]anthracene	0.42		0.19	0.019	ug/L	1	610		Total/NA
Benzo[b]fluoranthene	0.58		0.093	0.019	ug/L	1	610		Total/NA
Benzo[k]fluoranthene	0.28		0.13	0.019	ug/L	1	610		Total/NA
Benzo[g,h,i]perylene	0.67		0.19	0.019	ug/L	1	610		Total/NA
Benzo[a]pyrene	0.75		0.093	0.019	ug/L	1	610		Total/NA
Chrysene	0.80		0.093	0.019	ug/L	1	610		Total/NA
Dibenz(a,h)anthracene	0.15 J p		0.19	0.028	ug/L	1	610		Total/NA
Fluoranthene	0.72		0.19	0.028	ug/L	1	610		Total/NA
Indeno[1,2,3-cd]pyrene	0.42 p		0.19	0.037	ug/L	1	610		Total/NA
Phenanthrene	0.37 J		0.47	0.047	ug/L	1	610		Total/NA
Pyrene	0.46 p		0.19	0.028	ug/L	1	610		Total/NA
Antimony	6.2 J		10	3.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Arsenic	67		10	3.3	ug/L	1	200.7 Rev 4.4		Total Recoverable
Beryllium	0.57 J		5.0	0.21	ug/L	1	200.7 Rev 4.4		Total Recoverable
Cadmium	0.38 J		2.0	0.29	ug/L	1	200.7 Rev 4.4		Total Recoverable
Chromium	8.6		5.0	0.55	ug/L	1	200.7 Rev 4.4		Total Recoverable
Cobalt	2.6 J		7.0	0.84	ug/L	1	200.7 Rev 4.4		Total Recoverable
Manganese	98		15	5.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Nickel	14 J		40	1.6	ug/L	1	200.7 Rev 4.4		Total Recoverable
Selenium	6.9 J		15	5.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Chloride	260		5.0	2.0	mg/L	5	9056A		Total/NA
Fluoride	0.85 J		1.0	0.0090	mg/L	1	9056A		Total/NA
Sulfate	290		5.0	0.65	mg/L	5	9056A		Total/NA
Total Dissolved Solids	2900		20	15	mg/L	1	SM 2540C		Total/NA

### Client Sample ID: DAY 3 Q2 (QUENCH 10)

### Lab Sample ID: 240-69080-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.11 J p		0.19	0.019	ug/L	1	610		Total/NA
Benzo[b]fluoranthene	0.15		0.093	0.019	ug/L	1	610		Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

## Detection Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Client Sample ID: DAY 3 Q2 (QUENCH 10) (Continued)

### Lab Sample ID: 240-69080-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[k]fluoranthene	0.066	J	0.13	0.019	ug/L	1	610		Total/NA
Benzo[a]pyrene	0.15	p	0.093	0.019	ug/L	1	610		Total/NA
Chrysene	0.19	p	0.093	0.019	ug/L	1	610		Total/NA
Fluoranthene	0.24		0.19	0.028	ug/L	1	610		Total/NA
Indeno[1,2,3-cd]pyrene	0.11	J p	0.19	0.037	ug/L	1	610		Total/NA
Phenanthrene	0.15	J	0.47	0.047	ug/L	1	610		Total/NA
Pyrene	0.24		0.19	0.028	ug/L	1	610		Total/NA
Arsenic	54		10	3.3	ug/L	1	200.7 Rev 4.4		Total
Beryllium	0.32	J	5.0	0.21	ug/L	1	200.7 Rev 4.4		Recoverable
Chromium	3.7	J	5.0	0.55	ug/L	1	200.7 Rev 4.4		Total
Cobalt	1.6	J	7.0	0.84	ug/L	1	200.7 Rev 4.4		Recoverable
Manganese	67		15	5.1	ug/L	1	200.7 Rev 4.4		Total
Nickel	8.6	J	40	1.6	ug/L	1	200.7 Rev 4.4		Recoverable
Selenium	7.1	J	15	5.1	ug/L	1	200.7 Rev 4.4		Total
Cyanide, Total	0.0082	J	0.010	0.0050	mg/L	1	9012B		Total/NA
Chloride	260		5.0	2.0	mg/L	5	9056A		Total/NA
Fluoride	0.83	J	1.0	0.0090	mg/L	1	9056A		Total/NA
Sulfate	290		5.0	0.65	mg/L	5	9056A		Total/NA
Total Dissolved Solids	930		20	15	mg/L	1	SM 2540C		Total/NA

### Client Sample ID: DAY 3 Q3 (QUENCH 20)

### Lab Sample ID: 240-69080-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.029	J p	0.19	0.019	ug/L	1	610		Total/NA
Benzo[b]fluoranthene	0.041	J p	0.093	0.019	ug/L	1	610		Total/NA
Benzo[k]fluoranthene	0.024	J	0.13	0.019	ug/L	1	610		Total/NA
Chrysene	0.073	J p	0.093	0.019	ug/L	1	610		Total/NA
Fluoranthene	0.14	J	0.19	0.028	ug/L	1	610		Total/NA
Phenanthrene	0.11	J	0.47	0.047	ug/L	1	610		Total/NA
Pyrene	0.12	J	0.19	0.028	ug/L	1	610		Total/NA
Antimony	7.2	J	10	3.1	ug/L	1	200.7 Rev 4.4		Total
Arsenic	69		10	3.3	ug/L	1	200.7 Rev 4.4		Recoverable
Beryllium	0.50	J	5.0	0.21	ug/L	1	200.7 Rev 4.4		Total
Chromium	4.0	J	5.0	0.55	ug/L	1	200.7 Rev 4.4		Recoverable
Cobalt	1.9	J	7.0	0.84	ug/L	1	200.7 Rev 4.4		Total
Manganese	59		15	5.1	ug/L	1	200.7 Rev 4.4		Recoverable
Nickel	9.9	J	40	1.6	ug/L	1	200.7 Rev 4.4		Total
Selenium	6.3	J	15	5.1	ug/L	1	200.7 Rev 4.4		Recoverable
Cyanide, Total	0.0055	J	0.010	0.0050	mg/L	1	9012B		Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

## Detection Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q3 (QUENCH 20) (Continued)**

**Lab Sample ID: 240-69080-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	270		5.0	2.0	mg/L	5	9056A		Total/NA
Fluoride	0.92	J	1.0	0.0090	mg/L	1	9056A		Total/NA
Sulfate	310		5.0	0.65	mg/L	5	9056A		Total/NA
Total Dissolved Solids	960		20	15	mg/L	1	SM 2540C		Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q1 (QUENCH 1)**

Date Collected: 09/01/16 10:30

Date Received: 09/03/16 09:30

**Lab Sample ID: 240-69080-1**

Matrix: Water

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L		09/09/16 16:30		1
Benzene	1.0	U	1.0	0.35	ug/L		09/09/16 16:30		1
Bromoform	1.0	U	1.0	0.56	ug/L		09/09/16 16:30		1
Bromomethane	1.0	U	1.0	0.44	ug/L		09/09/16 16:30		1
Carbon disulfide	1.0	U	1.0	0.38	ug/L		09/09/16 16:30		1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L		09/09/16 16:30		1
Chlorobenzene	1.0	U	1.0	0.25	ug/L		09/09/16 16:30		1
Chloroethane	1.0	U	1.0	0.32	ug/L		09/09/16 16:30		1
Chloroform	1.0	U	1.0	0.25	ug/L		09/09/16 16:30		1
Chloromethane	1.0	U	1.0	0.44	ug/L		09/09/16 16:30		1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L		09/09/16 16:30		1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L		09/09/16 16:30		1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L		09/09/16 16:30		1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L		09/09/16 16:30		1
Ethylbenzene	1.0	U	1.0	0.25	ug/L		09/09/16 16:30		1
Iodomethane	1.0	U	1.0	0.42	ug/L		09/09/16 16:30		1
Methylene Chloride	1.0	U	1.0	0.33	ug/L		09/09/16 16:30		1
Styrene	1.0	U	1.0	0.45	ug/L		09/09/16 16:30		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L		09/09/16 16:30		1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L		09/09/16 16:30		1
Toluene	1.0	U	1.0	0.23	ug/L		09/09/16 16:30		1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L		09/09/16 16:30		1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L		09/09/16 16:30		1
Trichloroethene	1.0	U	1.0	0.22	ug/L		09/09/16 16:30		1
Vinyl chloride	1.0	U	1.0	0.29	ug/L		09/09/16 16:30		1
Xylenes, Total	2.0	U	2.0	0.52	ug/L		09/09/16 16:30		1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		73 - 120		09/09/16 16:30	1
Dibromofluoromethane (Surr)	102		80 - 120		09/09/16 16:30	1
1,2-Dichloroethane-d4 (Surr)	116		63 - 132		09/09/16 16:30	1
Toluene-d8 (Surr)	106		73 - 124		09/09/16 16:30	1

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Acenaphthene</b>	<b>0.19</b>		0.19	0.041	ug/L		09/06/16 07:58	09/07/16 16:42	1
Acenaphthylene	0.19	U	0.19	0.019	ug/L		09/06/16 07:58	09/07/16 16:42	1
Anthracene	0.19	U	0.19	0.029	ug/L		09/06/16 07:58	09/07/16 16:42	1
Benzo[a]anthracene	0.35		0.19	0.055	ug/L		09/06/16 07:58	09/07/16 16:42	1
Benzo[b]fluoranthene	0.59		0.19	0.055	ug/L		09/06/16 07:58	09/07/16 16:42	1
Benzo[k]fluoranthene	0.28		0.19	0.044	ug/L		09/06/16 07:58	09/07/16 16:42	1
Benzo[g,h,i]perylene	0.36		0.19	0.046	ug/L		09/06/16 07:58	09/07/16 16:42	1
Benzo[a]pyrene	0.43		0.19	0.028	ug/L		09/06/16 07:58	09/07/16 16:42	1
Chrysene	0.44		0.19	0.032	ug/L		09/06/16 07:58	09/07/16 16:42	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.037	ug/L		09/06/16 07:58	09/07/16 16:42	1
Fluoranthene	0.57		0.19	0.025	ug/L		09/06/16 07:58	09/07/16 16:42	1
Fluorene	0.19	U	0.19	0.031	ug/L		09/06/16 07:58	09/07/16 16:42	1
Indeno[1,2,3-cd]pyrene	0.30		0.19	0.044	ug/L		09/06/16 07:58	09/07/16 16:42	1
Naphthalene	0.19		0.19	0.040	ug/L		09/06/16 07:58	09/07/16 16:42	1
Phenanthrene	0.46		0.19	0.029	ug/L		09/06/16 07:58	09/07/16 16:42	1

TestAmerica Canton

# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

## Client Sample ID: DAY 3 Q1 (QUENCH 1)

Date Collected: 09/01/16 10:30

Date Received: 09/03/16 09:30

## Lab Sample ID: 240-69080-1

Matrix: Water

### Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	0.48		0.19	0.026	ug/L		09/06/16 07:58	09/07/16 16:42	1
Tentatively Identified Compound	Est. Result	Qualifier	Unit			D	RT	CAS No.	Prepared Analyzed Dil Fac
Perylene TIC	9.3	U	ug/L					198-55-0	09/06/16 07:58 09/07/16 16:42 1
Surrogate	%Recovery	Qualifier	Limits						Prepared Analyzed Dil Fac
2-Fluorobiphenyl (Surr)	61		44 - 120						09/06/16 07:58 09/07/16 16:42 1
2-Fluorophenol (Surr)	56		26 - 120						09/06/16 07:58 09/07/16 16:42 1
2,4,6-Tribromophenol (Surr)	60		36 - 120						09/06/16 07:58 09/07/16 16:42 1
Nitrobenzene-d5 (Surr)	58		44 - 120						09/06/16 07:58 09/07/16 16:42 1
Phenol-d5 (Surr)	37		16 - 120						09/06/16 07:58 09/07/16 16:42 1
Terphenyl-d14 (Surr)	70		43 - 120						09/06/16 07:58 09/07/16 16:42 1

### Method: 610 - PAHs (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.38	J p	0.93	0.16	ug/L		09/07/16 16:47	09/08/16 12:50	1
Acenaphthylene	0.93	U	0.93	0.21	ug/L		09/07/16 16:47	09/08/16 12:50	1
Anthracene	0.12	J p	0.93	0.093	ug/L		09/07/16 16:47	09/08/16 12:50	1
Benzo[a]anthracene	0.42		0.19	0.019	ug/L		09/07/16 16:47	09/08/16 12:50	1
Benzo[b]fluoranthene	0.58		0.093	0.019	ug/L		09/07/16 16:47	09/08/16 12:50	1
Benzo[k]fluoranthene	0.28		0.13	0.019	ug/L		09/07/16 16:47	09/08/16 12:50	1
Benzo[g,h,i]perylene	0.67		0.19	0.019	ug/L		09/07/16 16:47	09/08/16 12:50	1
Benzo[a]pyrene	0.75		0.093	0.019	ug/L		09/07/16 16:47	09/08/16 12:50	1
Chrysene	0.80		0.093	0.019	ug/L		09/07/16 16:47	09/08/16 12:50	1
Dibenz(a,h)anthracene	0.15	J p	0.19	0.028	ug/L		09/07/16 16:47	09/08/16 12:50	1
Fluoranthene	0.72		0.19	0.028	ug/L		09/07/16 16:47	09/08/16 12:50	1
Fluorene	0.47	U	0.47	0.037	ug/L		09/07/16 16:47	09/08/16 12:50	1
Indeno[1,2,3-cd]pyrene	0.42	p	0.19	0.037	ug/L		09/07/16 16:47	09/08/16 12:50	1
Naphthalene	0.93	U	0.93	0.32	ug/L		09/07/16 16:47	09/08/16 12:50	1
Phenanthrene	0.37	J	0.47	0.047	ug/L		09/07/16 16:47	09/08/16 12:50	1
Pyrene	0.46	p	0.19	0.028	ug/L		09/07/16 16:47	09/08/16 12:50	1
Surrogate	%Recovery	Qualifier	Limits						Prepared Analyzed Dil Fac
p-Terphenyl	64	p	52 - 135						09/07/16 16:47 09/08/16 12:50 1

### Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/04/16 12:40	09/05/16 13:33	1

### Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	6.2	J	10	3.1	ug/L		09/08/16 14:00	09/09/16 14:42	1
Arsenic	67		10	3.3	ug/L		09/06/16 14:00	09/08/16 17:47	1
Beryllium	0.57	J	5.0	0.21	ug/L		09/06/16 14:00	09/08/16 17:47	1
Cadmium	0.38	J	2.0	0.29	ug/L		09/06/16 14:00	09/08/16 17:47	1
Chromium	8.6		5.0	0.55	ug/L		09/06/16 14:00	09/08/16 17:47	1
Cobalt	2.6	J	7.0	0.84	ug/L		09/06/16 14:00	09/08/16 17:47	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/08/16 17:47	1
Manganese	98		15	5.1	ug/L		09/06/16 14:00	09/08/16 17:47	1
Nickel	14	J	40	1.6	ug/L		09/06/16 14:00	09/08/16 17:47	1
Selenium	6.9	J	15	5.1	ug/L		09/06/16 14:00	09/08/16 17:47	1

TestAmerica Canton

# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

## **Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 11:30	1

## **General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 13:37	09/06/16 13:37	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L		09/06/16 13:37	09/06/16 13:37	1
Cyanide, Total	0.010	U	0.010	0.0050	mg/L	09/06/16 14:27	09/06/16 16:11		1
<b>Chloride</b>	<b>260</b>		5.0	2.0	mg/L		09/07/16 07:25		5
Fluoride	0.85	J	1.0	0.0090	mg/L		09/07/16 07:05		1
Sulfate	290		5.0	0.65	mg/L		09/07/16 07:25		5
<b>Total Dissolved Solids</b>	<b>2900</b>		20	15	mg/L		09/07/16 10:09		1

## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69080-2**

Date Collected: 09/01/16 13:00

Matrix: Water

Date Received: 09/03/16 09:30

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L			09/09/16 16:52	1
Benzene	1.0	U	1.0	0.35	ug/L			09/09/16 16:52	1
Bromoform	1.0	U	1.0	0.56	ug/L			09/09/16 16:52	1
Bromomethane	1.0	U	1.0	0.44	ug/L			09/09/16 16:52	1
Carbon disulfide	1.0	U	1.0	0.38	ug/L			09/09/16 16:52	1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L			09/09/16 16:52	1
Chlorobenzene	1.0	U	1.0	0.25	ug/L			09/09/16 16:52	1
Chloroethane	1.0	U	1.0	0.32	ug/L			09/09/16 16:52	1
Chloroform	1.0	U	1.0	0.25	ug/L			09/09/16 16:52	1
Chloromethane	1.0	U	1.0	0.44	ug/L			09/09/16 16:52	1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L			09/09/16 16:52	1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L			09/09/16 16:52	1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L			09/09/16 16:52	1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L			09/09/16 16:52	1
Ethylbenzene	1.0	U	1.0	0.25	ug/L			09/09/16 16:52	1
Iodomethane	1.0	U	1.0	0.42	ug/L			09/09/16 16:52	1
Methylene Chloride	1.0	U	1.0	0.33	ug/L			09/09/16 16:52	1
Styrene	1.0	U	1.0	0.45	ug/L			09/09/16 16:52	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L			09/09/16 16:52	1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L			09/09/16 16:52	1
Toluene	1.0	U	1.0	0.23	ug/L			09/09/16 16:52	1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L			09/09/16 16:52	1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L			09/09/16 16:52	1
Trichloroethene	1.0	U	1.0	0.22	ug/L			09/09/16 16:52	1
Vinyl chloride	1.0	U	1.0	0.29	ug/L			09/09/16 16:52	1
Xylenes, Total	2.0	U	2.0	0.52	ug/L			09/09/16 16:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		73 - 120		09/09/16 16:52	1
Dibromofluoromethane (Surr)	106		80 - 120		09/09/16 16:52	1
1,2-Dichloroethane-d4 (Surr)	117		63 - 132		09/09/16 16:52	1
Toluene-d8 (Surr)	107		73 - 124		09/09/16 16:52	1

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.19	U	0.19	0.041	ug/L			09/06/16 07:58	1
Acenaphthylene	0.19	U	0.19	0.019	ug/L			09/06/16 07:58	1
Anthracene	0.19	U	0.19	0.029	ug/L			09/06/16 07:58	1
Benzo[a]anthracene	0.19	U	0.19	0.055	ug/L			09/06/16 07:58	1
Benzo[b]fluoranthene	0.19	U	0.19	0.055	ug/L			09/06/16 07:58	1
Benzo[k]fluoranthene	0.19	U	0.19	0.044	ug/L			09/06/16 07:58	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.046	ug/L			09/06/16 07:58	1
Benzo[a]pyrene	0.19	U	0.19	0.028	ug/L			09/06/16 07:58	1
Chrysene	0.19	U	0.19	0.032	ug/L			09/06/16 07:58	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.037	ug/L			09/06/16 07:58	1
Fluoranthene	0.19	U	0.19	0.025	ug/L			09/06/16 07:58	1
Fluorene	0.19	U	0.19	0.031	ug/L			09/06/16 07:58	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.044	ug/L			09/06/16 07:58	1
Naphthalene	0.19	U	0.19	0.040	ug/L			09/06/16 07:58	1
Phenanthrene	0.19	U	0.19	0.029	ug/L			09/06/16 07:58	1

TestAmerica Canton

# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69080-2**

Date Collected: 09/01/16 13:00

Matrix: Water

Date Received: 09/03/16 09:30

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	0.19	U	0.19	0.026	ug/L		09/06/16 07:58	09/07/16 16:16	1
<b>Tentatively Identified Compound</b>									
Perylene TIC	9.3	U			ug/L		198-55-0	09/06/16 07:58	09/07/16 16:16
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
2-Fluorobiphenyl (Surr)	67		44 - 120				09/06/16 07:58	09/07/16 16:16	1
2-Fluorophenol (Surr)	57		26 - 120				09/06/16 07:58	09/07/16 16:16	1
2,4,6-Tribromophenol (Surr)	63		36 - 120				09/06/16 07:58	09/07/16 16:16	1
Nitrobenzene-d5 (Surr)	60		44 - 120				09/06/16 07:58	09/07/16 16:16	1
Phenol-d5 (Surr)	35		16 - 120				09/06/16 07:58	09/07/16 16:16	1
Terphenyl-d14 (Surr)	74		43 - 120				09/06/16 07:58	09/07/16 16:16	1

## Method: 610 - PAHs (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.93	U	0.93	0.16	ug/L		09/07/16 16:47	09/08/16 13:14	1
Acenaphthylene	0.93	U	0.93	0.21	ug/L		09/07/16 16:47	09/08/16 13:14	1
Anthracene	0.93	U	0.93	0.093	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Benzo[a]anthracene</b>	<b>0.11 J p</b>		0.19	0.019	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Benzo[b]fluoranthene</b>	<b>0.15</b>		0.093	0.019	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Benzo[k]fluoranthene</b>	<b>0.066 J</b>		0.13	0.019	ug/L		09/07/16 16:47	09/08/16 13:14	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.019	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Benzo[a]pyrene</b>	<b>0.15 p</b>		0.093	0.019	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Chrysene</b>	<b>0.19 p</b>		0.093	0.019	ug/L		09/07/16 16:47	09/08/16 13:14	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.028	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Fluoranthene</b>	<b>0.24</b>		0.19	0.028	ug/L		09/07/16 16:47	09/08/16 13:14	1
Fluorene	0.47	U	0.47	0.037	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Indeno[1,2,3-cd]pyrene</b>	<b>0.11 J p</b>		0.19	0.037	ug/L		09/07/16 16:47	09/08/16 13:14	1
Naphthalene	0.93	U	0.93	0.32	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Phenanthrene</b>	<b>0.15 J</b>		0.47	0.047	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Pyrene</b>	<b>0.24</b>		0.19	0.028	ug/L		09/07/16 16:47	09/08/16 13:14	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
p-Terphenyl	67		52 - 135				09/07/16 16:47	09/08/16 13:14	1

## Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/04/16 12:40	09/05/16 13:41	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	10	U	10	3.1	ug/L		09/08/16 14:00	09/09/16 14:54	1
<b>Arsenic</b>	<b>54</b>		10	3.3	ug/L		09/06/16 14:00	09/08/16 00:43	1
<b>Beryllium</b>	<b>0.32 J</b>		5.0	0.21	ug/L		09/06/16 14:00	09/08/16 00:43	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/08/16 00:43	1
Chromium	3.7	J	5.0	0.55	ug/L		09/06/16 14:00	09/08/16 00:43	1
Cobalt	1.6	J	7.0	0.84	ug/L		09/06/16 14:00	09/08/16 00:43	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/08/16 18:04	1
Manganese	67		15	5.1	ug/L		09/06/16 14:00	09/08/16 00:43	1
Nickel	8.6	J	40	1.6	ug/L		09/06/16 14:00	09/08/16 00:43	1
Selenium	7.1	J	15	5.1	ug/L		09/06/16 14:00	09/08/16 00:43	1

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## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Method: 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 11:32	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 13:47	09/06/16 13:47	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L		09/06/16 13:47	09/06/16 13:47	1
Cyanide, Total	0.0082	J	0.010	0.0050	mg/L		09/06/16 14:27	09/06/16 16:53	1
Chloride	260		5.0	2.0	mg/L		09/07/16 10:07	09/07/16 10:07	5
Fluoride	0.83	J	1.0	0.0090	mg/L		09/07/16 09:06	09/07/16 09:06	1
Sulfate	290		5.0	0.65	mg/L		09/07/16 10:07	09/07/16 10:07	5
Total Dissolved Solids	930		20	15	mg/L		09/07/16 10:09	09/07/16 10:09	1



# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q3 (QUENCH 20)**

**Lab Sample ID: 240-69080-3**

Date Collected: 09/01/16 16:20

Matrix: Water

Date Received: 09/03/16 09:30

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L		09/09/16 17:14		1
Benzene	1.0	U	1.0	0.35	ug/L		09/09/16 17:14		1
Bromoform	1.0	U	1.0	0.56	ug/L		09/09/16 17:14		1
Bromomethane	1.0	U	1.0	0.44	ug/L		09/09/16 17:14		1
Carbon disulfide	1.0	U	1.0	0.38	ug/L		09/09/16 17:14		1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L		09/09/16 17:14		1
Chlorobenzene	1.0	U	1.0	0.25	ug/L		09/09/16 17:14		1
Chloroethane	1.0	U	1.0	0.32	ug/L		09/09/16 17:14		1
Chloroform	1.0	U	1.0	0.25	ug/L		09/09/16 17:14		1
Chloromethane	1.0	U	1.0	0.44	ug/L		09/09/16 17:14		1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L		09/09/16 17:14		1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L		09/09/16 17:14		1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L		09/09/16 17:14		1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L		09/09/16 17:14		1
Ethylbenzene	1.0	U	1.0	0.25	ug/L		09/09/16 17:14		1
Iodomethane	1.0	U	1.0	0.42	ug/L		09/09/16 17:14		1
Methylene Chloride	1.0	U	1.0	0.33	ug/L		09/09/16 17:14		1
Styrene	1.0	U	1.0	0.45	ug/L		09/09/16 17:14		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L		09/09/16 17:14		1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L		09/09/16 17:14		1
Toluene	1.0	U	1.0	0.23	ug/L		09/09/16 17:14		1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L		09/09/16 17:14		1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L		09/09/16 17:14		1
Trichloroethene	1.0	U	1.0	0.22	ug/L		09/09/16 17:14		1
Vinyl chloride	1.0	U	1.0	0.29	ug/L		09/09/16 17:14		1
Xylenes, Total	2.0	U	2.0	0.52	ug/L		09/09/16 17:14		1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		73 - 120		09/09/16 17:14	1
Dibromofluoromethane (Surr)	103		80 - 120		09/09/16 17:14	1
1,2-Dichloroethane-d4 (Surr)	115		63 - 132		09/09/16 17:14	1
Toluene-d8 (Surr)	108		73 - 124		09/09/16 17:14	1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.19	U	0.19	0.042	ug/L		09/06/16 07:58	09/07/16 15:51	1
Acenaphthylene	0.19	U	0.19	0.019	ug/L		09/06/16 07:58	09/07/16 15:51	1
Anthracene	0.19	U	0.19	0.030	ug/L		09/06/16 07:58	09/07/16 15:51	1
Benzo[a]anthracene	0.19	U	0.19	0.057	ug/L		09/06/16 07:58	09/07/16 15:51	1
Benzo[b]fluoranthene	0.19	U	0.19	0.057	ug/L		09/06/16 07:58	09/07/16 15:51	1
Benzo[k]fluoranthene	0.19	U	0.19	0.046	ug/L		09/06/16 07:58	09/07/16 15:51	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.048	ug/L		09/06/16 07:58	09/07/16 15:51	1
Benzo[a]pyrene	0.19	U	0.19	0.029	ug/L		09/06/16 07:58	09/07/16 15:51	1
Chrysene	0.19	U	0.19	0.034	ug/L		09/06/16 07:58	09/07/16 15:51	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.038	ug/L		09/06/16 07:58	09/07/16 15:51	1
Fluoranthene	0.19	U	0.19	0.026	ug/L		09/06/16 07:58	09/07/16 15:51	1
Fluorene	0.19	U	0.19	0.033	ug/L		09/06/16 07:58	09/07/16 15:51	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.046	ug/L		09/06/16 07:58	09/07/16 15:51	1
Naphthalene	0.19	U	0.19	0.041	ug/L		09/06/16 07:58	09/07/16 15:51	1
Phenanthrene	0.19	U	0.19	0.030	ug/L		09/06/16 07:58	09/07/16 15:51	1

TestAmerica Canton

# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q3 (QUENCH 20)**

**Lab Sample ID: 240-69080-3**

Date Collected: 09/01/16 16:20

Matrix: Water

Date Received: 09/03/16 09:30

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	0.19	U	0.19	0.027	ug/L		09/06/16 07:58	09/07/16 15:51	1
<b>Tentatively Identified Compound</b>									
Perylene TIC	9.6	U			ug/L		198-55-0	09/06/16 07:58	09/07/16 15:51
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
2-Fluorobiphenyl (Surr)	60		44 - 120				09/06/16 07:58	09/07/16 15:51	1
2-Fluorophenol (Surr)	58		26 - 120				09/06/16 07:58	09/07/16 15:51	1
2,4,6-Tribromophenol (Surr)	56		36 - 120				09/06/16 07:58	09/07/16 15:51	1
Nitrobenzene-d5 (Surr)	57		44 - 120				09/06/16 07:58	09/07/16 15:51	1
Phenol-d5 (Surr)	36		16 - 120				09/06/16 07:58	09/07/16 15:51	1
Terphenyl-d14 (Surr)	67		43 - 120				09/06/16 07:58	09/07/16 15:51	1

## Method: 610 - PAHs (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.93	U	0.93	0.16	ug/L		09/07/16 16:47	09/08/16 13:38	1
Acenaphthylene	0.93	U	0.93	0.21	ug/L		09/07/16 16:47	09/08/16 13:38	1
Anthracene	0.93	U	0.93	0.093	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Benzo[a]anthracene</b>	<b>0.029</b>	<b>J p</b>	0.19	0.019	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Benzo[b]fluoranthene</b>	<b>0.041</b>	<b>J p</b>	0.093	0.019	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Benzo[k]fluoranthene</b>	<b>0.024</b>	<b>J</b>	0.13	0.019	ug/L		09/07/16 16:47	09/08/16 13:38	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.019	ug/L		09/07/16 16:47	09/08/16 13:38	1
Benzo[a]pyrene	0.093	U	0.093	0.019	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Chrysene</b>	<b>0.073</b>	<b>J p</b>	0.093	0.019	ug/L		09/07/16 16:47	09/08/16 13:38	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.028	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Fluoranthene</b>	<b>0.14</b>	<b>J</b>	0.19	0.028	ug/L		09/07/16 16:47	09/08/16 13:38	1
Fluorene	0.47	U	0.47	0.037	ug/L		09/07/16 16:47	09/08/16 13:38	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.037	ug/L		09/07/16 16:47	09/08/16 13:38	1
Naphthalene	0.93	U	0.93	0.32	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Phenanthrene</b>	<b>0.11</b>	<b>J</b>	0.47	0.047	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Pyrene</b>	<b>0.12</b>	<b>J</b>	0.19	0.028	ug/L		09/07/16 16:47	09/08/16 13:38	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
p-Terphenyl	62		52 - 135				09/07/16 16:47	09/08/16 13:38	1

## Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/04/16 12:40	09/05/16 13:49	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Antimony</b>	<b>7.2</b>	<b>J</b>	10	3.1	ug/L		09/08/16 14:00	09/09/16 14:59	1
<b>Arsenic</b>	<b>69</b>		10	3.3	ug/L		09/06/16 14:00	09/08/16 00:48	1
<b>Beryllium</b>	<b>0.50</b>	<b>J</b>	5.0	0.21	ug/L		09/06/16 14:00	09/08/16 00:48	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/08/16 00:48	1
<b>Chromium</b>	<b>4.0</b>	<b>J</b>	5.0	0.55	ug/L		09/06/16 14:00	09/08/16 00:48	1
<b>Cobalt</b>	<b>1.9</b>	<b>J</b>	7.0	0.84	ug/L		09/06/16 14:00	09/08/16 00:48	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/08/16 18:08	1
<b>Manganese</b>	<b>59</b>		15	5.1	ug/L		09/06/16 14:00	09/08/16 00:48	1
<b>Nickel</b>	<b>9.9</b>	<b>J</b>	40	1.6	ug/L		09/06/16 14:00	09/08/16 00:48	1
<b>Selenium</b>	<b>6.3</b>	<b>J</b>	15	5.1	ug/L		09/06/16 14:00	09/08/16 00:48	1

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## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### **Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 11:35	1

### **General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 13:56	09/06/16 13:56	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L		09/06/16 13:56	09/06/16 13:56	1
<b>Cyanide, Total</b>	<b>0.0055 J</b>		0.010	0.0050	mg/L	09/06/16 14:27	09/06/16 16:11	1	
Chloride	270		5.0	2.0	mg/L		09/07/16 10:47	09/07/16 10:47	5
Fluoride	0.92 J		1.0	0.0090	mg/L		09/07/16 10:27	09/07/16 10:27	1
Sulfate	310		5.0	0.65	mg/L		09/07/16 10:47	09/07/16 10:47	5
Total Dissolved Solids	960		20	15	mg/L		09/07/16 10:09	09/07/16 10:09	1



## Surrogate Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (73-120)	DBFM (80-120)	12DCE (63-132)	TOL (73-124)
240-69080-1	DAY 3 Q1 (QUENCH 1)	99	102	116	106
240-69080-2	DAY 3 Q2 (QUENCH 10)	95	106	117	107
240-69080-3	DAY 3 Q3 (QUENCH 20)	96	103	115	108
LCS 240-246159/4	Lab Control Sample	100	107	114	107
MB 240-246159/6	Method Blank	96	106	119	109

#### Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

12DCE = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (44-120)	2FP (26-120)	TBP (36-120)	NBZ (44-120)	PHL (16-120)	TPH (43-120)
240-69080-1	DAY 3 Q1 (QUENCH 1)	61	56	60	58	37	70
240-69080-2	DAY 3 Q2 (QUENCH 10)	67	57	63	60	35	74
240-69080-3	DAY 3 Q3 (QUENCH 20)	60	58	56	57	36	67
LCS 240-245545/20-A	Lab Control Sample	79	65	85	87	41	89
MB 240-245545/19-A	Method Blank	67	52	62	62	29	76

#### Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)

2FP = 2-Fluorophenol (Surr)

TBP = 2,4,6-Tribromophenol (Surr)

NBZ = Nitrobenzene-d5 (Surr)

PHL = Phenol-d5 (Surr)

TPH = Terphenyl-d14 (Surr)

### Method: 610 - PAHs (HPLC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		PTP2 (52-135)			
240-69080-1	DAY 3 Q1 (QUENCH 1)	64 p			
240-69080-2	DAY 3 Q2 (QUENCH 10)	67			
240-69080-3	DAY 3 Q3 (QUENCH 20)	62			
LCS 490-368437/2-A	Lab Control Sample	74			
MB 490-368437/1-A	Method Blank	86			

#### Surrogate Legend

PTP = p-Terphenyl

# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 240-246159/6**

**Matrix: Water**

**Analysis Batch: 246159**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L			09/09/16 14:25	1
Benzene	1.0	U	1.0	0.35	ug/L			09/09/16 14:25	1
Bromoform	1.0	U	1.0	0.56	ug/L			09/09/16 14:25	1
Bromomethane	1.0	U	1.0	0.44	ug/L			09/09/16 14:25	1
Carbon disulfide	1.0	U	1.0	0.38	ug/L			09/09/16 14:25	1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L			09/09/16 14:25	1
Chlorobenzene	1.0	U	1.0	0.25	ug/L			09/09/16 14:25	1
Chloroethane	1.0	U	1.0	0.32	ug/L			09/09/16 14:25	1
Chloroform	1.0	U	1.0	0.25	ug/L			09/09/16 14:25	1
Chloromethane	1.0	U	1.0	0.44	ug/L			09/09/16 14:25	1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L			09/09/16 14:25	1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L			09/09/16 14:25	1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L			09/09/16 14:25	1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L			09/09/16 14:25	1
Ethylbenzene	1.0	U	1.0	0.25	ug/L			09/09/16 14:25	1
Iodomethane	1.0	U	1.0	0.42	ug/L			09/09/16 14:25	1
Methylene Chloride	1.0	U	1.0	0.33	ug/L			09/09/16 14:25	1
Styrene	1.0	U	1.0	0.45	ug/L			09/09/16 14:25	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L			09/09/16 14:25	1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L			09/09/16 14:25	1
Toluene	1.0	U	1.0	0.23	ug/L			09/09/16 14:25	1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L			09/09/16 14:25	1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L			09/09/16 14:25	1
Trichloroethene	1.0	U	1.0	0.22	ug/L			09/09/16 14:25	1
Vinyl chloride	1.0	U	1.0	0.29	ug/L			09/09/16 14:25	1
Xylenes, Total	2.0	U	2.0	0.52	ug/L			09/09/16 14:25	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		73 - 120		09/09/16 14:25	1
Dibromofluoromethane (Surr)	106		80 - 120		09/09/16 14:25	1
1,2-Dichloroethane-d4 (Surr)	119		63 - 132		09/09/16 14:25	1
Toluene-d8 (Surr)	109		73 - 124		09/09/16 14:25	1

**Lab Sample ID: LCS 240-246159/4**

**Matrix: Water**

**Analysis Batch: 246159**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acrylonitrile	100	106		ug/L		106	69 - 125
Benzene	10.0	10.3		ug/L		103	80 - 120
Bromoform	10.0	9.61		ug/L		96	52 - 157
Bromomethane	10.0	5.70		ug/L		57	24 - 160
Carbon disulfide	10.0	9.82		ug/L		98	58 - 160
Carbon tetrachloride	10.0	12.5		ug/L		125	69 - 149
Chlorobenzene	10.0	10.6		ug/L		106	80 - 120
Chloroethane	10.0	4.95		ug/L		49	24 - 147
Chloroform	10.0	11.6		ug/L		116	80 - 120
Chloromethane	10.0	10.5		ug/L		105	50 - 135

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## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: LCS 240-246159/4**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Matrix: Water**

**Analysis Batch: 246159**

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.
	Added	Result	Qualifier				Limits
Dichlorobromomethane	10.0	11.3		ug/L	113	76 - 125	
1,2-Dichloroethane	10.0	12.2		ug/L	122	76 - 130	
1,1-Dichloroethene	10.0	9.50		ug/L	95	70 - 141	
1,2-Dichloropropane	10.0	11.8		ug/L	118	79 - 121	
Ethylbenzene	10.0	10.5		ug/L	105	80 - 120	
Iodomethane	10.0	9.60		ug/L	96	68 - 150	
Methylene Chloride	10.0	9.98		ug/L	100	68 - 136	
Styrene	10.0	10.1		ug/L	101	80 - 120	
1,1,2,2-Tetrachloroethane	10.0	10.6		ug/L	106	61 - 130	
Tetrachloroethene	10.0	10.8		ug/L	108	80 - 123	
Toluene	10.0	11.0		ug/L	110	80 - 121	
1,1,1-Trichloroethane	10.0	11.4		ug/L	114	79 - 133	
1,1,2-Trichloroethane	10.0	11.3		ug/L	113	80 - 120	
Trichloroethene	10.0	10.4		ug/L	104	80 - 122	
Vinyl chloride	10.0	8.61		ug/L	86	60 - 129	
Xylenes, Total	20.0	19.6		ug/L	98	80 - 120	
<hr/>							
Surrogate	LCS	LCS	Limits	Unit	D	%Rec	%Rec.
	%Recovery	Qualifier					
4-Bromofluorobenzene (Surr)	100		73 - 120				
Dibromofluoromethane (Surr)	107		80 - 120				
1,2-Dichloroethane-d4 (Surr)	114		63 - 132				
Toluene-d8 (Surr)	107		73 - 124				

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 240-245545/19-A**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 245545**

**Matrix: Water**

**Analysis Batch: 245724**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Acenaphthene	0.20	U	0.20	0.044	ug/L	09/06/16 07:58	09/07/16 13:45		1
Acenaphthylene	0.20	U	0.20	0.020	ug/L	09/06/16 07:58	09/07/16 13:45		1
Anthracene	0.20	U	0.20	0.031	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[a]anthracene	0.20	U	0.20	0.059	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[b]fluoranthene	0.20	U	0.20	0.059	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[k]fluoranthene	0.20	U	0.20	0.048	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[g,h,i]perylene	0.20	U	0.20	0.050	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[a]pyrene	0.20	U	0.20	0.030	ug/L	09/06/16 07:58	09/07/16 13:45		1
Chrysene	0.20	U	0.20	0.035	ug/L	09/06/16 07:58	09/07/16 13:45		1
Dibenz(a,h)anthracene	0.20	U	0.20	0.040	ug/L	09/06/16 07:58	09/07/16 13:45		1
Fluoranthene	0.20	U	0.20	0.027	ug/L	09/06/16 07:58	09/07/16 13:45		1
Fluorene	0.20	U	0.20	0.034	ug/L	09/06/16 07:58	09/07/16 13:45		1
Indeno[1,2,3-cd]pyrene	0.20	U	0.20	0.048	ug/L	09/06/16 07:58	09/07/16 13:45		1
Naphthalene	0.20	U	0.20	0.043	ug/L	09/06/16 07:58	09/07/16 13:45		1
Phenanthrene	0.20	U	0.20	0.031	ug/L	09/06/16 07:58	09/07/16 13:45		1
Pyrene	0.20	U	0.20	0.028	ug/L	09/06/16 07:58	09/07/16 13:45		1

TestAmerica Canton

# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 240-245545/19-A**

**Matrix: Water**

**Analysis Batch: 245724**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 245545**

Tentatively Identified Compound	MB MB		Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
	Est. Result	Qualifier							
Perylene TIC	10	U	ug/L			198-55-0	09/06/16 07:58	09/07/16 13:45	1
<b>Surrogate</b>									
2-Fluorobiphenyl (Surr)	67		44 - 120				09/06/16 07:58	09/07/16 13:45	1
2-Fluorophenol (Surr)	52		26 - 120				09/06/16 07:58	09/07/16 13:45	1
2,4,6-Tribromophenol (Surr)	62		36 - 120				09/06/16 07:58	09/07/16 13:45	1
Nitrobenzene-d5 (Surr)	62		44 - 120				09/06/16 07:58	09/07/16 13:45	1
Phenol-d5 (Surr)	29		16 - 120				09/06/16 07:58	09/07/16 13:45	1
Terphenyl-d14 (Surr)	76		43 - 120				09/06/16 07:58	09/07/16 13:45	1

**Lab Sample ID: LCS 240-245545/20-A**

**Matrix: Water**

**Analysis Batch: 245724**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 245545**

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits	%Rec.
		Result	Qualifier					
Acenaphthene	32.0	25.2		ug/L		79	58 - 120	
Acenaphthylene	32.0	24.6		ug/L		77	59 - 120	
Anthracene	32.0	24.8		ug/L		77	58 - 120	
Benzo[a]anthracene	32.0	24.5		ug/L		77	58 - 120	
Benzo[b]fluoranthene	32.0	26.9		ug/L		84	59 - 120	
Benzo[k]fluoranthene	32.0	26.8		ug/L		84	61 - 120	
Benzo[g,h,i]perylene	32.0	28.0		ug/L		88	41 - 127	
Benzo[a]pyrene	32.0	27.8		ug/L		87	63 - 120	
Chrysene	32.0	24.6		ug/L		77	59 - 120	
Dibenz(a,h)anthracene	32.0	28.4		ug/L		89	39 - 125	
Fluoranthene	32.0	25.1		ug/L		78	59 - 120	
Fluorene	32.0	25.5		ug/L		80	57 - 120	
Indeno[1,2,3-cd]pyrene	32.0	28.0		ug/L		88	49 - 121	
Naphthalene	32.0	25.1		ug/L		78	58 - 120	
Phenanthrene	32.0	24.6		ug/L		77	57 - 120	
Pyrene	32.0	24.6		ug/L		77	57 - 120	

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-Fluorobiphenyl (Surr)	79		44 - 120
2-Fluorophenol (Surr)	65		26 - 120
2,4,6-Tribromophenol (Surr)	85		36 - 120
Nitrobenzene-d5 (Surr)	87		44 - 120
Phenol-d5 (Surr)	41		16 - 120
Terphenyl-d14 (Surr)	89		43 - 120

TestAmerica Canton

# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

## Method: 610 - PAHs (HPLC)

**Lab Sample ID: MB 490-368437/1-A**

**Matrix: Water**

**Analysis Batch: 368617**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 368437**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	1.0	U	1.0	0.17	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Acenaphthylene	1.0	U	1.0	0.23	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Anthracene	1.0	U	1.0	0.10	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Benzo[a]anthracene	0.20	U	0.20	0.020	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Benzo[b]fluoranthene	0.10	U	0.10	0.020	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Benzo[k]fluoranthene	0.14	U	0.14	0.020	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Benzo[g,h,i]perylene	0.20	U	0.20	0.020	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Benzo[a]pyrene	0.10	U	0.10	0.020	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Chrysene	0.10	U	0.10	0.020	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Dibenz(a,h)anthracene	0.20	U	0.20	0.030	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Fluoranthene	0.20	U	0.20	0.030	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Fluorene	0.50	U	0.50	0.040	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Indeno[1,2,3-cd]pyrene	0.20	U	0.20	0.040	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Naphthalene	1.0	U	1.0	0.34	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Phenanthrene	0.50	U	0.50	0.050	ug/L	09/07/16 16:47	09/08/16 12:01	1	
Pyrene	0.20	U	0.20	0.030	ug/L	09/07/16 16:47	09/08/16 12:01	1	
<b>Surrogate</b>	<b>MB %Recovery</b>	<b>MB Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
<i>p-Terphenyl</i>	86		52 - 135				09/07/16 16:47	09/08/16 12:01	1

**Lab Sample ID: LCS 490-368437/2-A**

**Matrix: Water**

**Analysis Batch: 368617**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 368437**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limts	%Rec.
Acenaphthene	2.50	1.67		ug/L	67	10 - 124		
Acenaphthylene	7.50	4.58		ug/L	61	10 - 139		
Anthracene	2.50	2.00		ug/L	80	10 - 126		
Benzo[a]anthracene	2.50	2.01		ug/L	80	12 - 135		
Benzo[b]fluoranthene	2.50	2.00		ug/L	80	10 - 150		
Benzo[k]fluoranthene	2.50	2.01		ug/L	80	10 - 159		
Benzo[g,h,i]perylene	2.50	1.54		ug/L	61	10 - 116		
Benzo[a]pyrene	2.50	2.01		ug/L	81	10 - 128		
Chrysene	2.50	2.04		ug/L	82	10 - 199		
Dibenz(a,h)anthracene	2.50	1.01		ug/L	40	10 - 110		
Fluoranthene	2.50	1.86		ug/L	74	14 - 123		
Fluorene	2.50	1.65		ug/L	66	10 - 142		
Indeno[1,2,3-cd]pyrene	2.50	2.02		ug/L	81	10 - 116		
Naphthalene	2.50	1.50		ug/L	60	10 - 122		
Phenanthrene	2.50	1.75		ug/L	70	10 - 155		
Pyrene	2.50	1.81		ug/L	72	10 - 140		
<b>Surrogate</b>	<b>LCS %Recovery</b>	<b>LCS Qualifier</b>	<b>Limits</b>					
<i>p-Terphenyl</i>	74		52 - 135					

TestAmerica Canton

## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Method: 8315A - Carbonyl Compounds by HPLC

**Lab Sample ID:** MB 240-245473/4-A

**Matrix:** Water

**Analysis Batch:** 245490

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 245473

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.0106	J	0.050	0.010	mg/L		09/04/16 12:40	09/05/16 13:57	1

**Lab Sample ID:** LCS 240-245473/5-A

**Matrix:** Water

**Analysis Batch:** 245490

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 245473

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec.	Limits
Formaldehyde	0.200	0.149		mg/L		74	30 - 142

### Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID:** MB 240-245616/1-A

**Matrix:** Water

**Analysis Batch:** 246090

**Client Sample ID:** Method Blank

**Prep Type:** Total Recoverable

**Prep Batch:** 245616

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	10	U	10	3.3	ug/L		09/06/16 14:00	09/08/16 17:26	1
Beryllium	5.0	U	5.0	0.21	ug/L		09/06/16 14:00	09/08/16 17:26	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/08/16 17:26	1
Chromium	5.0	U	5.0	0.55	ug/L		09/06/16 14:00	09/08/16 17:26	1
Cobalt	7.0	U	7.0	0.84	ug/L		09/06/16 14:00	09/08/16 17:26	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/08/16 17:26	1
Manganese	15	U	15	5.1	ug/L		09/06/16 14:00	09/08/16 17:26	1
Nickel	40	U	40	1.6	ug/L		09/06/16 14:00	09/08/16 17:26	1
Selenium	15	U	15	5.1	ug/L		09/06/16 14:00	09/08/16 17:26	1

**Lab Sample ID:** LCS 240-245616/2-A

**Matrix:** Water

**Analysis Batch:** 246090

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total Recoverable

**Prep Batch:** 245616

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec.	Limits
Arsenic	2000	2170		ug/L		109	85 - 115
Beryllium	50.0	50.1		ug/L		100	85 - 115
Cadmium	50.0	54.7		ug/L		109	85 - 115
Chromium	200	201		ug/L		101	85 - 115
Cobalt	500	510		ug/L		102	85 - 115
Lead	500	500		ug/L		100	85 - 115
Manganese	500	513		ug/L		103	85 - 115
Nickel	500	513		ug/L		103	85 - 115
Selenium	2000	2220		ug/L		111	85 - 115

**Lab Sample ID:** MB 240-246007/1-A

**Matrix:** Water

**Analysis Batch:** 246150

**Client Sample ID:** Method Blank

**Prep Type:** Total Recoverable

**Prep Batch:** 246007

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	10	U	10	3.1	ug/L		09/08/16 14:00	09/09/16 09:54	1
Arsenic	10	U	10	3.3	ug/L		09/08/16 14:00	09/09/16 09:54	1
Beryllium	0.382	J	5.0	0.21	ug/L		09/08/16 14:00	09/09/16 09:54	1

TestAmerica Canton

## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID:** MB 240-246007/1-A

**Matrix:** Water

**Analysis Batch:** 246150

**Client Sample ID:** Method Blank

**Prep Type:** Total Recoverable

**Prep Batch:** 246007

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	2.0	U	2.0	0.29	ug/L		09/08/16 14:00	09/09/16 09:54	1
Chromium	5.0	U	5.0	0.55	ug/L		09/08/16 14:00	09/09/16 09:54	1
Cobalt	7.0	U	7.0	0.84	ug/L		09/08/16 14:00	09/09/16 09:54	1
Lead	5.0	U	5.0	1.9	ug/L		09/08/16 14:00	09/09/16 09:54	1
Manganese	15	U	15	5.1	ug/L		09/08/16 14:00	09/09/16 09:54	1
Nickel	40	U	40	1.6	ug/L		09/08/16 14:00	09/09/16 09:54	1
Selenium	15	U	15	5.1	ug/L		09/08/16 14:00	09/09/16 09:54	1

**Lab Sample ID:** LCS 240-246007/2-A

**Matrix:** Water

**Analysis Batch:** 246150

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total Recoverable

**Prep Batch:** 246007

Analyte	Spike Added	LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Antimony	500	519		ug/L		104	85 - 115
Arsenic	2000	2240		ug/L		112	85 - 115
Beryllium	50.0	53.6		ug/L		107	85 - 115
Cadmium	50.0	55.2		ug/L		110	85 - 115
Chromium	200	207		ug/L		103	85 - 115
Cobalt	500	524		ug/L		105	85 - 115
Lead	500	531		ug/L		106	85 - 115
Manganese	500	528		ug/L		106	85 - 115
Nickel	500	538		ug/L		108	85 - 115
Selenium	2000	2260		ug/L		113	85 - 115

### Method: 245.1 - Mercury (CVAA)

**Lab Sample ID:** MB 240-245621/1-A

**Matrix:** Water

**Analysis Batch:** 245820

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 245621

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 10:40	1

**Lab Sample ID:** LCS 240-245621/2-A

**Matrix:** Water

**Analysis Batch:** 245820

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 245621

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	5.00	5.11		ug/L		102	85 - 115

### Method: 4500 S2 F-2000 - Sulfide, Total

**Lab Sample ID:** MB 240-245602/1

**Matrix:** Water

**Analysis Batch:** 245602

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 11:16		1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L			09/06/16 11:16	1

TestAmerica Canton

## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Lab Sample ID: LCS 240-245602/2**

**Matrix: Water**

**Analysis Batch: 245602**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Sulfide	23.7	23.6		mg/L	100	79 - 110	

**Method: 9012B - Cyanide, Total andor Amenable**

**Lab Sample ID: MB 240-245668/1-A**

**Matrix: Water**

**Analysis Batch: 245668**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 245668**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.010	U	0.010	0.0050	mg/L		09/06/16 14:27	09/06/16 16:05	1

**Lab Sample ID: LCS 240-245668/2-A**

**Matrix: Water**

**Analysis Batch: 245668**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 245668**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Cyanide, Total	0.0400	0.0328		mg/L	82	69 - 118	

**Method: 9056A - Anions, Ion Chromatography**

**Lab Sample ID: MB 240-245678/27**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0	0.41	mg/L			09/07/16 08:26	1
Fluoride	1.0	U	1.0	0.0090	mg/L			09/07/16 08:26	1
Sulfate	1.0	U	1.0	0.13	mg/L			09/07/16 08:26	1

**Lab Sample ID: MB 240-245678/3**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0	0.41	mg/L			09/07/16 00:22	1
Fluoride	1.0	U	1.0	0.0090	mg/L			09/07/16 00:22	1
Sulfate	1.0	U	1.0	0.13	mg/L			09/07/16 00:22	1

**Lab Sample ID: LCS 240-245678/28**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Chloride	50.0	53.4		mg/L	107	90 - 110	
Fluoride	2.50	2.71		mg/L	108	90 - 110	
Sulfate	50.0	52.2		mg/L	104	90 - 110	

TestAmerica Canton

# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCS 240-245678/4**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Chloride	50.0	53.4		mg/L	107	90 - 110	
Fluoride	2.50	2.69		mg/L	108	90 - 110	
Sulfate	50.0	52.1		mg/L	104	90 - 110	

**Lab Sample ID: 240-69080-2 MS**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: DAY 3 Q2 (QUENCH 10)**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec.
Fluoride	0.83	J	2.50	3.41		mg/L	103	80 - 120	

**Lab Sample ID: 240-69080-2 MSD**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: DAY 3 Q2 (QUENCH 10)**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec.	RPD	RPD	Limit
Fluoride	0.83	J	2.50	3.41		mg/L	103	80 - 120		0	0	15

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 240-245781/1**

**Matrix: Water**

**Analysis Batch: 245781**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U		10	7.4 mg/L			09/07/16 10:09	1

**Lab Sample ID: LCS 240-245781/2**

**Matrix: Water**

**Analysis Batch: 245781**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Total Dissolved Solids	216	214		mg/L	99	88 - 110	

## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### GC/MS VOA

#### Analysis Batch: 246159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	8260B	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	8260B	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	8260B	
MB 240-246159/6	Method Blank	Total/NA	Water	8260B	
LCS 240-246159/4	Lab Control Sample	Total/NA	Water	8260B	

### GC/MS Semi VOA

#### Prep Batch: 245545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	3510C	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	3510C	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	3510C	
MB 240-245545/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-245545/20-A	Lab Control Sample	Total/NA	Water	3510C	

#### Analysis Batch: 245724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	8270C	245545
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	8270C	245545
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	8270C	245545
MB 240-245545/19-A	Method Blank	Total/NA	Water	8270C	245545
LCS 240-245545/20-A	Lab Control Sample	Total/NA	Water	8270C	245545

### HPLC/IC

#### Prep Batch: 245473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	8315A_W_Prep	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	8315A_W_Prep	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	8315A_W_Prep	
MB 240-245473/4-A	Method Blank	Total/NA	Water	8315A_W_Prep	
LCS 240-245473/5-A	Lab Control Sample	Total/NA	Water	8315A_W_Prep	

#### Analysis Batch: 245490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	8315A	245473
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	8315A	245473
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	8315A	245473
MB 240-245473/4-A	Method Blank	Total/NA	Water	8315A	245473
LCS 240-245473/5-A	Lab Control Sample	Total/NA	Water	8315A	245473

#### Prep Batch: 368437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	610	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	610	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	610	
MB 490-368437/1-A	Method Blank	Total/NA	Water	610	
LCS 490-368437/2-A	Lab Control Sample	Total/NA	Water	610	

## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### HPLC/IC (Continued)

#### Analysis Batch: 368617

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	610	368437
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	610	368437
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	610	368437
MB 490-368437/1-A	Method Blank	Total/NA	Water	610	368437
LCS 490-368437/2-A	Lab Control Sample	Total/NA	Water	610	368437

### Metals

#### Prep Batch: 245616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total Recoverable	Water	200.7	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total Recoverable	Water	200.7	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total Recoverable	Water	200.7	
MB 240-245616/1-A	Method Blank	Total Recoverable	Water	200.7	
LCS 240-245616/2-A	Lab Control Sample	Total Recoverable	Water	200.7	

#### Prep Batch: 245621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	245.1	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	245.1	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	245.1	
MB 240-245621/1-A	Method Blank	Total/NA	Water	245.1	
LCS 240-245621/2-A	Lab Control Sample	Total/NA	Water	245.1	

#### Analysis Batch: 245804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total Recoverable	Water	200.7 Rev 4.4	245616

#### Analysis Batch: 245820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	245.1	245621
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	245.1	245621
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	245.1	245621
MB 240-245621/1-A	Method Blank	Total/NA	Water	245.1	245621
LCS 240-245621/2-A	Lab Control Sample	Total/NA	Water	245.1	245621

#### Prep Batch: 246007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total Recoverable	Water	200.7	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total Recoverable	Water	200.7	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total Recoverable	Water	200.7	
MB 240-246007/1-A	Method Blank	Total Recoverable	Water	200.7	
LCS 240-246007/2-A	Lab Control Sample	Total Recoverable	Water	200.7	

#### Analysis Batch: 246090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total Recoverable	Water	200.7 Rev 4.4	245616

TestAmerica Canton

## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Metals (Continued)

#### Analysis Batch: 246090 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-245616/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	245616
LCS 240-245616/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	245616

#### Analysis Batch: 246150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total Recoverable	Water	200.7 Rev 4.4	246007
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total Recoverable	Water	200.7 Rev 4.4	246007
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total Recoverable	Water	200.7 Rev 4.4	246007
MB 240-246007/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	246007
LCS 240-246007/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	246007

### General Chemistry

#### Analysis Batch: 245602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	4500 S2 F-2000	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	4500 S2 F-2000	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	4500 S2 F-2000	
MB 240-245602/1	Method Blank	Total/NA	Water	4500 S2 F-2000	
LCS 240-245602/2	Lab Control Sample	Total/NA	Water	4500 S2 F-2000	

#### Prep Batch: 245668

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	9012B	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	9012B	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	9012B	
MB 240-245668/1-A	Method Blank	Total/NA	Water	9012B	
LCS 240-245668/2-A	Lab Control Sample	Total/NA	Water	9012B	

#### Analysis Batch: 245678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	9056A	
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	9056A	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	9056A	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	9056A	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	9056A	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	9056A	
MB 240-245678/27	Method Blank	Total/NA	Water	9056A	
MB 240-245678/3	Method Blank	Total/NA	Water	9056A	
LCS 240-245678/28	Lab Control Sample	Total/NA	Water	9056A	
LCS 240-245678/4	Lab Control Sample	Total/NA	Water	9056A	
240-69080-2 MS	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	9056A	
240-69080-2 MSD	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	9056A	

#### Analysis Batch: 245689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	9012B	245668
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	9012B	245668
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	9012B	245668
MB 240-245668/1-A	Method Blank	Total/NA	Water	9012B	245668

## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### General Chemistry (Continued)

#### Analysis Batch: 245689 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 240-245668/2-A	Lab Control Sample	Total/NA	Water	9012B	245668

#### Analysis Batch: 245781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69080-1	DAY 3 Q1 (QUENCH 1)	Total/NA	Water	SM 2540C	
240-69080-2	DAY 3 Q2 (QUENCH 10)	Total/NA	Water	SM 2540C	
240-69080-3	DAY 3 Q3 (QUENCH 20)	Total/NA	Water	SM 2540C	
MB 240-245781/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-245781/2	Lab Control Sample	Total/NA	Water	SM 2540C	

## Lab Chronicle

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

**Client Sample ID: DAY 3 Q1 (QUENCH 1)**

Date Collected: 09/01/16 10:30

Date Received: 09/03/16 09:30

**Lab Sample ID: 240-69080-1**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	246159	09/09/16 16:30	LRW	TAL CAN
Total/NA	Prep	3510C			245545	09/06/16 07:58	CS	TAL CAN
Total/NA	Analysis	8270C		1	245724	09/07/16 16:42	TMH	TAL CAN
Total/NA	Prep	610			368437	09/07/16 16:47	DHC	TAL NSH
Total/NA	Analysis	610		1	368617	09/08/16 12:50	ET	TAL NSH
Total/NA	Prep	8315A_W_Prep			245473	09/04/16 12:40	CS	TAL CAN
Total/NA	Analysis	8315A		1	245490	09/05/16 13:33	KMG	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246090	09/08/16 17:47	RKT	TAL CAN
Total Recoverable	Prep	200.7			246007	09/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246150	09/09/16 14:42	RKT	TAL CAN
Total/NA	Prep	245.1			245621	09/06/16 14:00	AJC	TAL CAN
Total/NA	Analysis	245.1		1	245820	09/07/16 11:30	DSH	TAL CAN
Total/NA	Analysis	4500 S2 F-2000		1	245602	09/06/16 13:37	BLW	TAL CAN
Total/NA	Prep	9012B			245668	09/06/16 14:27	JWW	TAL CAN
Total/NA	Analysis	9012B		1	245689	09/06/16 16:11	JWW	TAL CAN
Total/NA	Analysis	9056A		1	245678	09/07/16 07:05	LCN	TAL CAN
Total/NA	Analysis	9056A		5	245678	09/07/16 07:25	LCN	TAL CAN
Total/NA	Analysis	SM 2540C		1	245781	09/07/16 10:09	JW	TAL CAN

**Client Sample ID: DAY 3 Q2 (QUENCH 10)**

Date Collected: 09/01/16 13:00

Date Received: 09/03/16 09:30

**Lab Sample ID: 240-69080-2**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	246159	09/09/16 16:52	LRW	TAL CAN
Total/NA	Prep	3510C			245545	09/06/16 07:58	CS	TAL CAN
Total/NA	Analysis	8270C		1	245724	09/07/16 16:16	TMH	TAL CAN
Total/NA	Prep	610			368437	09/07/16 16:47	DHC	TAL NSH
Total/NA	Analysis	610		1	368617	09/08/16 13:14	ET	TAL NSH
Total/NA	Prep	8315A_W_Prep			245473	09/04/16 12:40	CS	TAL CAN
Total/NA	Analysis	8315A		1	245490	09/05/16 13:41	KMG	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246090	09/08/16 18:04	RKT	TAL CAN
Total Recoverable	Prep	200.7			246007	09/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246150	09/09/16 14:54	RKT	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	245804	09/08/16 00:43	RKT	TAL CAN
Total/NA	Prep	245.1			245621	09/06/16 14:00	AJC	TAL CAN
Total/NA	Analysis	245.1		1	245820	09/07/16 11:32	DSH	TAL CAN
Total/NA	Analysis	4500 S2 F-2000		1	245602	09/06/16 13:47	BLW	TAL CAN
Total/NA	Prep	9012B			245668	09/06/16 14:27	JWW	TAL CAN
Total/NA	Analysis	9012B		1	245689	09/06/16 16:53	JWW	TAL CAN

TestAmerica Canton

## Lab Chronicle

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	245678	09/07/16 09:06	LCN	TAL CAN
Total/NA	Analysis	9056A		5	245678	09/07/16 10:07	LCN	TAL CAN
Total/NA	Analysis	SM 2540C		1	245781	09/07/16 10:09	JW	TAL CAN

**Client Sample ID: DAY 3 Q3 (QUENCH 20)**

Date Collected: 09/01/16 16:20

Date Received: 09/03/16 09:30

**Lab Sample ID: 240-69080-3**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	246159	09/09/16 17:14	LRW	TAL CAN
Total/NA	Prep	3510C			245545	09/06/16 07:58	CS	TAL CAN
Total/NA	Analysis	8270C		1	245724	09/07/16 15:51	TMH	TAL CAN
Total/NA	Prep	610			368437	09/07/16 16:47	DHC	TAL NSH
Total/NA	Analysis	610		1	368617	09/08/16 13:38	ET	TAL NSH
Total/NA	Prep	8315A_W_Prep			245473	09/04/16 12:40	CS	TAL CAN
Total/NA	Analysis	8315A		1	245490	09/05/16 13:49	KMG	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246090	09/08/16 18:08	RKT	TAL CAN
Total Recoverable	Prep	200.7			246007	09/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246150	09/09/16 14:59	RKT	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	245804	09/08/16 00:48	RKT	TAL CAN
Total/NA	Prep	245.1			245621	09/06/16 14:00	AJC	TAL CAN
Total/NA	Analysis	245.1		1	245820	09/07/16 11:35	DSH	TAL CAN
Total/NA	Analysis	4500 S2 F-2000		1	245602	09/06/16 13:56	BLW	TAL CAN
Total/NA	Prep	9012B			245668	09/06/16 14:27	JWW	TAL CAN
Total/NA	Analysis	9012B		1	245689	09/06/16 16:11	JWW	TAL CAN
Total/NA	Analysis	9056A		1	245678	09/07/16 10:27	LCN	TAL CAN
Total/NA	Analysis	9056A		5	245678	09/07/16 10:47	LCN	TAL CAN
Total/NA	Analysis	SM 2540C		1	245781	09/07/16 10:09	JW	TAL CAN

**Laboratory References:**

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

## Certification Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17
Illinois	NELAP	5	200004	07-31-17
Kansas	NELAP	7	E-10336	01-31-17
Kentucky (UST)	State Program	4	58	02-23-17
Kentucky (WW)	State Program	4	98016	12-31-16 *
Minnesota	NELAP	5	039-999-348	12-31-16 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17
Nevada	State Program	9	OH-000482008A	07-31-17
New Jersey	NELAP	2	OH001	06-30-17
New York	NELAP	2	10975	03-31-17
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-17
Pennsylvania	NELAP	3	68-00340	08-31-17
Texas	NELAP	6	T104704517-15-5	08-31-17
USDA	Federal		P330-13-00319	11-26-16 *
Virginia	NELAP	3	460175	09-14-16 *
Washington	State Program	10	C971	01-12-17
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17

### Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-17
A2LA	ISO/IEC 17025		0453.07	12-31-17
Alaska (UST)	State Program	10	UST-087	07-24-17
Arizona	State Program	9	AZ0473	05-05-17
Arkansas DEQ	State Program	6	88-0737	04-25-17
California	State Program	9	2938	10-31-16
Connecticut	State Program	1	PH-0220	12-31-17
Florida	NELAP	4	E87358	06-30-17
Georgia	State Program	4	N/A	12-31-17
Illinois	NELAP	5	200010	12-09-16 *
Iowa	State Program	7	131	04-01-18
Kansas	NELAP	7	E-10229	10-31-16 *
Kentucky (UST)	State Program	4	19	06-30-17
Kentucky (WW)	State Program	4	90038	12-31-16
Louisiana	NELAP	6	30613	06-30-17
Maine	State Program	1	TN00032	11-03-17
Maryland	State Program	3	316	03-31-17
Massachusetts	State Program	1	M-TN032	06-30-17
Minnesota	NELAP	5	047-999-345	12-31-16 *
Mississippi	State Program	4	N/A	06-30-16 *
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-17
New Hampshire	NELAP	1	2963	10-09-16 *

\* Certification renewal pending - certification considered valid.

TestAmerica Canton

## Certification Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69080-1

### Laboratory: TestAmerica Nashville (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
New Jersey	NELAP	2	TN965	06-30-17
New York	NELAP	2	11342	03-31-17
North Carolina (WW/SW)	State Program	4	387	12-31-16
North Dakota	State Program	8	R-146	06-30-17
Ohio VAP	State Program	5	CL0033	07-10-17
Oklahoma	State Program	6	9412	08-31-17
Oregon	NELAP	10	TN200001	04-27-17
Pennsylvania	NELAP	3	68-00585	06-30-17
Rhode Island	State Program	1	LAO00268	12-30-16
South Carolina	State Program	4	84009 (001)	02-18-17
South Carolina (Do Not Use - DW)	State Program	4	84009 (002)	12-16-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-17
USDA	Federal		P330-13-00306	10-30-16
Utah	NELAP	8	TN00032	07-31-17
Virginia	NELAP	3	460152	06-14-17
Washington	State Program	10	C789	07-19-17
West Virginia DEP	State Program	3	219	02-28-17
Wisconsin	State Program	5	998020430	08-31-17
Wyoming (UST)	A2LA	8	453.07	12-31-17



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<b>Sample Receipt Documentation .....</b>	<b>19</b>

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THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

## ANALYTICAL REPORT

PROJECT NO. 240-69080-1

AK Steel-Stack Quench Towers

Lot #: H6I070404

14

Opal Johnson

TestAmerica Canton  
4101 Shuffel Street NW  
North Canton, OH 44720

TESTAMERICA LABORATORIES, INC.

A handwritten signature in cursive ink that reads "Ryan Henry".

Ryan Henry  
Project Manager

September 22, 2016

## ANALYTICAL METHODS SUMMARY

H61070404

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Dioxins/Furans, HRGC/HRMS	EPA-5 1613B

### References:

EPA-5 "Method 1613: Tetra- through Octa- Chlorinated Dioxins and Furans by Isotope Dilution, HRGC/HRMS, Revision B", EPA, OCTOBER 1994

## SAMPLE SUMMARY

H61070404

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED DATE</u>	<u>SAMP TIME</u>
M87FK	001	DAY 3 Q1 (QUENCH 1)	09/01/16	10:30
M87FL	002	DAY 3 Q2 (QUENCH 10)	09/01/16	13:00
M87FM	003	DAY 3 Q3 (QUENCH 20)	09/01/16	16:20

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

## PROJECT NARRATIVE H6I070404

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

### **Sample Receipt**

There were no problems with the condition of the samples received.

### **Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is “the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point”. The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level:** The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

## PROJECT NARRATIVE H6I070404

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of  $\geq 2.5$  to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits ( $\pm 15\%$  of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within  $\pm 3$  seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.



## PROJECT NARRATIVE H6I070404

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.<sup>1,2,3</sup> The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Q_{\text{is}}}{H_{\text{is}} \times RRF \times W \times S}$$

Where:

- N = peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute
- H<sub>is</sub> = peak height of quantitation ion for appropriate internal standard
- Q<sub>is</sub> = amount of internal standard added to sample
- RRF = mean relative response factor of compound obtained during initial calibration
- W = amount of sample extracted (grams or liters)
- S = percent solids (optional, if results are requested to be reported on dry weight basis)

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{A_s \times Q_{\text{is}}}{A_{\text{is}} \times RRF \times W \times S}$$

Where:

- A<sub>s</sub> = Sum of areas of the target peaks
- Q<sub>is</sub> = amount of internal standard added to sample
- A<sub>is</sub> = Sum of areas of the internal standard peaks
- RRF = mean relative response factor of compound obtained during initial calibration

## PROJECT NARRATIVE H6I070404

W = amount of sample extracted (grams or liters)  
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of  $\geq 2.5$  times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenz-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenz-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

## CERTIFICATION SUMMARY

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Knoxville	L-A-B	DoD ELAP		L2311
TestAmerica Knoxville	Arkansas DEQ	State Program	6	88-0688
TestAmerica Knoxville	California	State Program	9	2423
TestAmerica Knoxville	Colorado	State Program	8	N/A
TestAmerica Knoxville	Connecticut	State Program	1	PH-0223
TestAmerica Knoxville	Florida	NELAC	4	E87177
TestAmerica Knoxville	Georgia	State Program	4	906
TestAmerica Knoxville	Hawaii	State Program	9	N/A
TestAmerica Knoxville	Kansas	NELAC	7	E-10349
TestAmerica Knoxville	Kentucky	State Program	4	90101
TestAmerica Knoxville	Louisiana DOHH	State Program	6	LA150004
TestAmerica Knoxville	Louisiana DEQ	NELAC	6	83979
TestAmerica Knoxville	Maryland	State Program	3	277
TestAmerica Knoxville	Michigan	State Program	5	9933
TestAmerica Knoxville	Nevada	State Program	9	TN00009
TestAmerica Knoxville	New Jersey	NELAC	2	TN001
TestAmerica Knoxville	New York	NELAC	2	10781
TestAmerica Knoxville	North Carolina DENR	State Program	4	64
TestAmerica Knoxville	North Carolina DHHS	State Program	4	21705
TestAmerica Knoxville	Ohio	OVAP	5	CL0059
TestAmerica Knoxville	Oklahoma	State Program	6	9415
TestAmerica Knoxville	Pennsylvania	NELAC	3	68-00576
TestAmerica Knoxville	South Carolina	State Program	4	84001
TestAmerica Knoxville	Tennessee	State Program	4	TN02014
TestAmerica Knoxville	Texas	NELAC	6	T104704380-14-7
TestAmerica Knoxville	Federal	USDA		P330-11-00260
TestAmerica Knoxville	Utah	NELAC	8	TN000092014-5
TestAmerica Knoxville	Virginia	NELAC	3	460176
TestAmerica Knoxville	Virginia	State Program	3	00165
TestAmerica Knoxville	Washington	State Program	10	C593
TestAmerica Knoxville	West Virginia DEP	State Program	3	345
TestAmerica Knoxville	West Virginia DHHR	State Program	3	9955C
TestAmerica Knoxville	Wisconsin	State Program	5	998044300

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

## TestAmerica Canton

Sample ID: DAY 3 Q1 (QUENCH 1)

Trace Level Organic Compounds

Lot - Sample #....:	H6I070404 - 001	Work Order #....:	M87FK1AA	Matrix....:	WATER
Date Sampled....:	09/01/16	Date Received....:	09/07/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1038 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

PARAMETER	RESULT	MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND	9.6	0.20	pg/L
1,2,3,7,8-PeCDD	ND	48	0.22	pg/L
1,2,3,4,7,8-HxCDD	ND	48	0.21	pg/L
1,2,3,6,7,8-HxCDD	ND	48	0.22	pg/L
1,2,3,7,8,9-HxCDD	1.1	B J	0.20	pg/L
1,2,3,4,6,7,8-HpCDD	2.3	Q B J	0.23	pg/L
OCDD	4.4	Q B J	0.13	pg/L
2,3,7,8-TCDF	0.85	Q J	0.24	pg/L
1,2,3,7,8-PeCDF	ND	48	0.22	pg/L
2,3,4,7,8-PeCDF	0.79	Q J	0.21	pg/L
1,2,3,4,7,8-HxCDF	1.7	C J	0.18	pg/L
1,2,3,6,7,8-HxCDF	0.46	Q B J	0.16	pg/L
2,3,4,6,7,8-HxCDF	ND	48	0.19	pg/L
1,2,3,7,8,9-HxCDF	ND	48	0.22	pg/L
1,2,3,4,6,7,8-HpCDF	2.1	B J	0.12	pg/L
1,2,3,4,7,8,9-HpCDF	0.82	B J	0.18	pg/L
OCDF	2.6	Q B J	0.24	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	65	25 - 164
13C-1,2,3,7,8-PeCDD	67	25 - 181
13C-1,2,3,4,7,8-HxCDD	66	32 - 141
13C-1,2,3,6,7,8-HxCDD	63	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	67	23 - 140
13C-OCDD	56	17 - 157
13C-2,3,7,8-TCDF	65	24 - 169
13C-1,2,3,7,8-PeCDF	70	24 - 185
13C-2,3,4,7,8-PeCDF	69	21 - 178
13C-1,2,3,4,7,8-HxCDF	68	26 - 152
13C-1,2,3,6,7,8-HxCDF	65	26 - 123
13C-2,3,4,6,7,8-HxCDF	67	28 - 136
13C-1,2,3,7,8,9-HxCDF	65	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	59	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	56	26 - 138
13C-OCDF	37	17 - 157

## TestAmerica Canton

Sample ID: DAY 3 Q1 (QUENCH 1)

Trace Level Organic Compounds

Lot - Sample #....:	H6I070404 - 001	Work Order #....:	M87FK1AA	Matrix....:	WATER
Date Sampled....:	09/01/16	Date Received....:	09/07/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1038 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	110	35 - 197

**QUALIFIERS**

- B Method blank contamination. The associated method blank contains the target analyte at a reportable level.
- C Co-eluting isomer.
- J Estimated Result.
- Q Estimated maximum possible concentration (EMPC).

**TestAmerica Canton**  
**Sample ID: DAY 3 Q2 (QUENCH 10)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I070404 - 002	Work Order #....:	M87FL1AA	Matrix....:	WATER
Date Sampled....:	09/01/16	Date Received....:	09/07/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1057 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		9.5	0.13	pg/L
1,2,3,7,8-PeCDD	ND		47	0.15	pg/L
1,2,3,4,7,8-HxCDD	ND		47	0.19	pg/L
1,2,3,6,7,8-HxCDD	ND		47	0.20	pg/L
1,2,3,7,8,9-HxCDD	0.67	B J	47	0.18	pg/L
1,2,3,4,6,7,8-HpCDD	1.6	B J	47	0.19	pg/L
OCDD	3.6	B J	95	0.15	pg/L
2,3,7,8-TCDF	0.54	J	9.5	0.17	pg/L
1,2,3,7,8-PeCDF	ND		47	0.15	pg/L
2,3,4,7,8-PeCDF	ND		47	0.14	pg/L
1,2,3,4,7,8-HxCDF	0.87	J	47	0.12	pg/L
1,2,3,6,7,8-HxCDF	ND		47	0.12	pg/L
2,3,4,6,7,8-HxCDF	ND		47	0.12	pg/L
1,2,3,7,8,9-HxCDF	ND		47	0.15	pg/L
1,2,3,4,6,7,8-HpCDF	1.3	B J	47	0.087	pg/L
1,2,3,4,7,8,9-HpCDF	ND		47	0.13	pg/L
OCDF	1.6	B J	95	0.16	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	66	25 - 164
13C-1,2,3,7,8-PeCDD	67	25 - 181
13C-1,2,3,4,7,8-HxCDD	66	32 - 141
13C-1,2,3,6,7,8-HxCDD	62	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	68	23 - 140
13C-OCDD	57	17 - 157
13C-2,3,7,8-TCDF	66	24 - 169
13C-1,2,3,7,8-PeCDF	67	24 - 185
13C-2,3,4,7,8-PeCDF	68	21 - 178
13C-1,2,3,4,7,8-HxCDF	67	26 - 152
13C-1,2,3,6,7,8-HxCDF	62	26 - 123
13C-2,3,4,6,7,8-HxCDF	66	28 - 136
13C-1,2,3,7,8,9-HxCDF	65	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	58	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	56	26 - 138
13C-OCDF	39	17 - 157

## TestAmerica Canton

Sample ID: DAY 3 Q2 (QUENCH 10)

Trace Level Organic Compounds

Lot - Sample #....:	H6I070404 - 002	Work Order #....:	M87FL1AA	Matrix....:	WATER
Date Sampled....:	09/01/16	Date Received....:	09/07/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1057 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
37Cl4-2,3,7,8-TCDD	107	35 - 197

QUALIFIERS

- B Method blank contamination. The associated method blank contains the target analyte at a reportable level.  
 J Estimated Result.

**TestAmerica Canton**  
**Sample ID: DAY 3 Q3 (QUENCH 20)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I070404 - 003	Work Order #....:	M87FM1AA	Matrix....:	WATER
Date Sampled....:	09/01/16	Date Received....:	09/07/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1049 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Kenneya L. Reynolds				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		9.5	0.11	pg/L
1,2,3,7,8-PeCDD	0.40	Q B J	48	0.12	pg/L
1,2,3,4,7,8-HxCDD	ND		48	0.23	pg/L
1,2,3,6,7,8-HxCDD	ND		48	0.25	pg/L
1,2,3,7,8,9-HxCDD	ND		48	0.23	pg/L
1,2,3,4,6,7,8-HpCDD	1.2	Q B J	48	0.23	pg/L
OCDD	4.6	Q B J	95	0.16	pg/L
2,3,7,8-TCDF	0.18	Q J	9.5	0.11	pg/L
1,2,3,7,8-PeCDF	ND		48	0.15	pg/L
2,3,4,7,8-PeCDF	0.47	Q J	48	0.15	pg/L
1,2,3,4,7,8-HxCDF	ND		48	0.12	pg/L
1,2,3,6,7,8-HxCDF	ND		48	0.13	pg/L
2,3,4,6,7,8-HxCDF	ND		48	0.13	pg/L
1,2,3,7,8,9-HxCDF	0.60	Q B J	48	0.17	pg/L
1,2,3,4,6,7,8-HpCDF	0.95	Q B J	48	0.082	pg/L
1,2,3,4,7,8,9-HpCDF	0.62	Q B J	48	0.12	pg/L
OCDF	2.8	Q B J	95	0.18	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	74	25 - 164
13C-1,2,3,7,8-PeCDD	72	25 - 181
13C-1,2,3,4,7,8-HxCDD	73	32 - 141
13C-1,2,3,6,7,8-HxCDD	67	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	73	23 - 140
13C-OCDD	61	17 - 157
13C-2,3,7,8-TCDF	74	24 - 169
13C-1,2,3,7,8-PeCDF	76	24 - 185
13C-2,3,4,7,8-PeCDF	73	21 - 178
13C-1,2,3,4,7,8-HxCDF	73	26 - 152
13C-1,2,3,6,7,8-HxCDF	68	26 - 123
13C-2,3,4,6,7,8-HxCDF	70	28 - 136
13C-1,2,3,7,8,9-HxCDF	67	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	62	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	63	26 - 138
13C-OCDF	42	17 - 157

## TestAmerica Canton

Sample ID: DAY 3 Q3 (QUENCH 20)

Trace Level Organic Compounds

Lot - Sample #....:	H61070404 - 003	Work Order #....:	M87FM1AA	Matrix....:	WATER
Date Sampled....:	09/01/16	Date Received....:	09/07/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1049 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Kenneya L. Reynolds				

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
37Cl4-2,3,7,8-TCDD	104	35 - 197

**QUALIFIERS**

- B Method blank contamination. The associated method blank contains the target analyte at a reportable level.  
 J Estimated Result.  
 Q Estimated maximum possible concentration (EMPC).

**Method Blank Report**  
**Trace Level Organic Compounds**

**Lot - Sample #....:** H6I090000 - 012B      **Work Order #....:** M87P91AA      **Matrix....:** WATER  
**Dilution Factor:** 1  
**Prep Date....:** 09/09/16      **Analysis Date....:** 09/16/16  
**Prep Batch # ....:** 6253012  
**Initial Wgt/Vol :** 1000 mL      **Instrument ID....:** D2A      **Method:** EPA-5 1613B  
**Analyst ID....:** Linda K. McWhirter

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	0.11	pg/L
1,2,3,7,8-PeCDD	0.64	J	50	0.14	pg/L
1,2,3,4,7,8-HxCDD	ND		50	0.23	pg/L
1,2,3,6,7,8-HxCDD	0.67	J	50	0.26	pg/L
1,2,3,7,8,9-HxCDD	1.3	J	50	0.23	pg/L
1,2,3,4,6,7,8-HpCDD	1.9	Q J	50	0.28	pg/L
OCDD	6.6	Q J	100	0.20	pg/L
2,3,7,8-TCDF	ND		10	0.090	pg/L
1,2,3,7,8-PeCDF	ND		50	0.14	pg/L
2,3,4,7,8-PeCDF	ND		50	0.13	pg/L
1,2,3,4,7,8-HxCDF	ND		50	0.17	pg/L
1,2,3,6,7,8-HxCDF	0.99	Q J	50	0.18	pg/L
2,3,4,6,7,8-HxCDF	0.65	Q J	50	0.18	pg/L
1,2,3,7,8,9-HxCDF	1.2	J	50	0.22	pg/L
1,2,3,4,6,7,8-HpCDF	0.90	Q J	50	0.12	pg/L
1,2,3,4,7,8,9-HpCDF	1.2	J	50	0.16	pg/L
OCDF	4.8	J	100	0.14	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	72	25 - 164
13C-1,2,3,7,8-PeCDD	73	25 - 181
13C-1,2,3,4,7,8-HxCDD	71	32 - 141
13C-1,2,3,6,7,8-HxCDD	64	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	63	23 - 140
13C-OCDD	54	17 - 157
13C-2,3,7,8-TCDF	69	24 - 169
13C-1,2,3,7,8-PeCDF	71	24 - 185
13C-2,3,4,7,8-PeCDF	71	21 - 178
13C-1,2,3,4,7,8-HxCDF	69	26 - 152
13C-1,2,3,6,7,8-HxCDF	64	26 - 123
13C-2,3,4,6,7,8-HxCDF	68	28 - 136
13C-1,2,3,7,8,9-HxCDF	68	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	58	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	63	26 - 138
13C-OCDF	47	17 - 157

**Method Blank Report**  
**Trace Level Organic Compounds**

**Lot - Sample #....:** H6I090000 - 012B

**Work Order #....:** M87P91AA

**Matrix....:** WATER

**Dilution Factor:** 1

**Prep Date....:** 09/09/16

**Analysis Date....:** 09/16/16

**Prep Batch # ....:** 6253012

**Initial Wgt/Vol :** 1000 mL

**Instrument ID....:** D2A

**Method:** EPA-5 1613B

**Analyst ID....:** Linda K. McWhirter

<b>SURROGATE</b>	<b>PERCENT RECOVERY</b>	<b>RECOVERY LIMITS</b>
37Cl4-2,3,7,8-TCDD	105	35 - 197

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

Client Lot # ...: H6I070404      Work Order # ...: M87P91AC-LCS      Matrix .......: WATER.  
 LCS Lot-Sample# : H6I090000 - 012  
 Prep Date .....: 09/09/16      Analysis Date ..: 09/16/16  
 Prep Batch # ...: 6253012  
 Dilution Factor : 1  
 Analyst ID.....: Linda K. McWhirter      Instrument ID..: D2A      Method.....: EPA-5 1613B  
 Initial Wgt/Vol: 1000 mL

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RECOVERY LIMITS
2,3,7,8-TCDD	200	197	pg/L	99	(67 - 158)
1,2,3,7,8-PeCDD	1000	1030	pg/L	103 B	(70 - 142)
1,2,3,4,7,8-HxCDD	1000	959	pg/L	96	(70 - 164)
1,2,3,6,7,8-HxCDD	1000	945	pg/L	95 B	(76 - 134)
1,2,3,7,8,9-HxCDD	1000	1030	pg/L	103 B	(64 - 162)
1,2,3,4,6,7,8-HpCDD	1000	940	pg/L	94 B	(70 - 140)
OCDD	2000	1770	pg/L	89 B	(78 - 144)
2,3,7,8-TCDF	200	202	pg/L	101	(75 - 158)
1,2,3,7,8-PeCDF	1000	882	pg/L	88	(80 - 134)
2,3,4,7,8-PeCDF	1000	950	pg/L	95	(68 - 160)
1,2,3,4,7,8-HxCDF	1000	981	pg/L	98	(72 - 134)
1,2,3,6,7,8-HxCDF	1000	958	pg/L	96 B	(84 - 130)
2,3,4,6,7,8-HxCDF	1000	960	pg/L	96 B	(70 - 156)
1,2,3,7,8,9-HxCDF	1000	917	pg/L	92 B	(78 - 130)
1,2,3,4,6,7,8-HpCDF	1000	967	pg/L	97 B	(82 - 122)
1,2,3,4,7,8,9-HpCDF	1000	964	pg/L	96 B	(78 - 138)
OCDF	2000	1780	pg/L	89 B	(63 - 170)

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	70	(20 - 175)
13C-1,2,3,7,8-PeCDD	71	(21 - 227)
13C-1,2,3,4,7,8-HxCDD	75	(21 - 193)
13C-1,2,3,6,7,8-HxCDD	71	(25 - 163)
13C-1,2,3,4,6,7,8-HpCDD	78	(26 - 166)
13C-OCDD	72	(13 - 199)
13C-2,3,7,8-TCDF	71	(22 - 152)
13C-1,2,3,7,8-PeCDF	75	(21 - 192)
13C-2,3,4,7,8-PeCDF	72	(13 - 328)
13C-1,2,3,4,7,8-HxCDF	74	(19 - 202)
13C-1,2,3,6,7,8-HxCDF	69	(21 - 159)
13C-2,3,4,6,7,8-HxCDF	73	(22 - 176)
13C-1,2,3,7,8,9-HxCDF	75	(17 - 205)
13C-1,2,3,4,6,7,8-HpCDF	68	(21 - 158)
13C-1,2,3,4,7,8,9-HpCDF	72	(20 - 186)
13C-OCDF	64	(13 - 199)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	107	(31 - 191)

**LABORATORY CONTROL SAMPLE DATA REPORT**  
**Trace Level Organic Compounds**

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

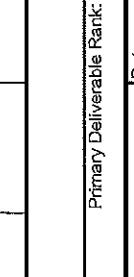
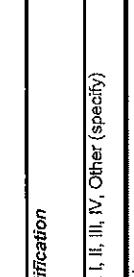
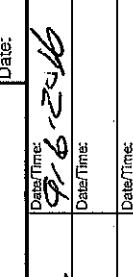
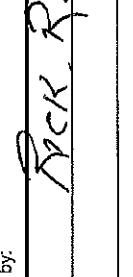
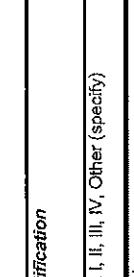


## Chain of Custody Record

TestAmerica Canton

4101 Shuffel Street NW  
North Canton, OH 44720  
Phone (330) 497-9396 Fax (330) 497-0772

### **Chain of Custody Record**

Client Information (Sub Contract Lab)		Sampler: Johnson, Opal		Carrier Tracking No.: COC No: 240-60915.1	
Shipping/Receiving Company: TestAmerica Laboratories, Inc.		Phone: opal.johnson@testamericalinc.com		Page: Page 1 of 1	
Address: 5815 Middlebrook Pike, City: Knoxville State: TN, Zip: 37921 Phone: 865-584-4915(Fax) Email: Project Name: AK Steel-Stack Testing Quench Towers Site:		Analysis Requested		Job #:	
Due Date Requested: 9/16/2016 TAT Requested (days):		Total Number of Containers: 1		COC No: 240-609080-1	
PO #: WO #: Project #: 24016104 SSOW#:		Preservation Codes: A - HCl B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Anchor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		Preservation Codes: M - Hexane N - None O - AsNaOz P - Na2O4S Q - Na2S2O3 R - Na2S2O4 S - H2SO4 T - TSP De-decarboxylate U - Acetone V - MCAC W - pH 4-5 Z - other (specify)	
Sample Identification - Client ID (Lab ID):		Sample Date: 9/1/16	Sample Time: 10:30	Sample Type (C=comm, G=grab): G	Matrix (W=water, S=solid, O=organic, A=air): A
		Preservation Code: X			
DAY 3 Q1 (QUENCH 1) (240-609080-1)		Water	X		Method 1613B
DAY 3 Q2 (QUENCH 10) (240-609080-2)		Water	X		Method 1613B
DAY 3 Q3 (QUENCH 20) (240-609080-3)		Water	X		Method 1613B
ND CUSTOM STAIN					
RECEIVED AT 03/03/2016 BY 9/1/16					
LORAN FRANCIS (62501022562)					
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify):		Primary Deliverable Rank: 2		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab	
Empty Kit Relinquished by: RICK R.		Date/Time: 9/6/2016	Time: 	Method of Shipment: Company Received by: 	
Relinquished by: 		Date/Time:	Received by:	Date/Time: 9/7/16	Company
Relinquished by: 		Date/Time:	Received by:	Date/Time: 10/21	Company
Relinquished by: 		Date/Time:	Received by:	Date/Time:	Company
Custody Seals intact: Yes A No		Custody Seal No.:	Cooler Temperature(s): °C and Other Remarks:		
Relinquished by: 		Date/Time:	Received by: 	Date/Time:	Company
Relinquished by: 		Date/Time:	Received by:	Date/Time:	Company
Relinquished by: 		Date/Time:	Received by:	Date/Time:	Company

## TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Log In Number:

1161070404

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?	/			<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?	/			<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C)	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted; Proceed/Cancel	
Thermometer ID : <u>SLL1</u> Correction factor: <u>0.0</u>				<input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC No tests on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> Holding Time - Receipt	
15. Were samples received within holding time?	/			<input type="checkbox"/> pH Adjusted, pH Included (See box 16A)	
16. Were samples received with correct chemical preservative (excluding Encore)?	/			<input type="checkbox"/> Incorrect Preservative <input type="checkbox"/> Headspace (VOA only)	
17. Were VOA samples received without headspace?	/			<input type="checkbox"/> Residual Chlorine	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)	/				
Chlorine test strip lot number: <u>1613B 2019/02</u>					
19. For 1613B water samples is pH<9?	/			<input type="checkbox"/> If no, lab will adjust <input type="checkbox"/> Project missing info	
20. For rad samples was sample activity info. Provided?	/				
Project #: <u>92113</u>	PM Instructions: <u>Normal</u>	Date: <u>9/7/16</u>			
Sample Receiving Associate: _____					QA026R30.doc, 080916

TestAmerica Canton  
4101 Shaffer Street NW  
North Canton, OH 44720  
Phone (330) 497-0772

0.4/C6.8 Chain of Custody Record

**Client Information**

Ms. Jill Blinzer

Environmental Quality Mgt., Inc.

Address:  
1800 Carillon Blvd

City:  
Cincinnati

State, Zip:  
OH, 45240

Phone:  
(513) 543-1063 (mobile)

E-mail:  
jblinzer@eqm.com

Project Name:  
AK Steel-Stack Testing Quench Towers

Site:  
AK Steel

Sample:

Jill Blinzer

Date:

7/11/16

Lab F/R:

Johnson, Opal

E-Mail:

Opal.johnson@testamericanci.com

Phone:

(513) 543-1063 (mobile)

TAT Requested (days):

Normal

PO #:

Purchase Order Requested

W/O R:

Project #:

94045404

SSW#:

Due Date Requested:

24016095-1

Analysis Requested:

QUOTE ONLY-17 Isomers (Use Hess Subcontr

1613B - QUOTE ONLY-17 Isomers (Use Hess Subcontr

610 - HPLC-PAH Analyte List

5012B - Cyanides, Total

8316A - Formaldehyde

2260B - (MDD) Priority Pollutant List MSVOA Sulf

2650C - Cadmium, 30ppm 2nd Chloride, Fluoride, SVL

20007, 2461

8270C - PAH Analyte List

5450D - S2 f - Local Method

20007, 2461

SM4500

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Possible Hazard Identification

Non-Hazard

Flammable

Skin Irritant

Poison A

Unknown

Radicalogical

Deliverable Requested: 1, II, III, IV, Other (specify)

Empty

Retriginished by:

Jill Blinzer

Date/Time:

7/11/16 10:30

Comments:

Concen

Received By:

Jill Blinzer

Company:

TestAmerica

Date/Time:

9/21/16 10:30

Comments:

Concen

Received By:

Jill Blinzer

Company:

TestAmerica

Date/Time:

9/21/16 10:30

Comments:

Concen

Received By:

Jill Blinzer

Company:

TestAmerica

Date/Time:

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Received By:

Jill Blinzer

Company:

TestAmerica

Date/Time:

9/21/16 10:30

Comments:

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Received By:

Jill Blinzer

**TestAmerica Canton Sample Receipt Form/Narrative**  
**Canton Facility**

Login # : 109080

Client EQM Site Name \_\_\_\_\_  
 Cooler Received on 9/3/16 Opened on 9/3/16 Cooler unpacked by: JM  
 FedEx: 1<sup>st</sup> Grd Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other

**Receipt After-hours: Drop-off Date/Time** **Storage Location**

TestAmerica Cooler #        Foam Box Client Cooler Box Other \_\_\_\_\_  
 Packing material used: Bubble Wrap Foam Plastic Bag None Other \_\_\_\_\_  
 COOLANT: Wet ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt  See Multiple Cooler Form  
 IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C  
 IR GUN #36 (CF +1.3°C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 2  Yes  No  NA  
 -Were custody seals on the outside of the cooler(s) signed & dated?  Yes  No  
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?  Yes  No
3. Shippers' packing slip attached to the cooler(s)?  Yes  No
4. Did custody papers accompany the sample(s)?  Yes  No
5. Were the custody papers relinquished & signed in the appropriate place?  Yes  No
6. Was/were the person(s) who collected the samples clearly identified on the COC?  Yes  No
7. Did all bottles arrive in good condition (Unbroken)?  Yes  No
8. Could all bottle labels be reconciled with the COC?  Yes  No
9. Were correct bottle(s) used for the test(s) indicated?  Yes  No
10. Sufficient quantity received to perform indicated analyses?  Yes  No
11. Are these work share samples?  Yes  No  
 If yes, Questions 11-15 have been checked at the originating laboratory.

11. Were sample(s) at the correct pH upon receipt?  Yes  No  NA pH Strip Lot# HC574756
12. Were VOAs on the COC?  Yes  No
13. Were air bubbles >6 mm in any VOA vials?  Yes  No  NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0324401A  Yes  No
15. Was a LL Hg or Me Hg trip blank present?  Yes  No

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other

Concerning \_\_\_\_\_

**14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES**

Samples processed by:

**15. SAMPLE CONDITION**

Sample(s) \_\_\_\_\_ were received after the recommended holding time had expired.  
 Sample(s) \_\_\_\_\_ were received in a broken container.  
 Sample(s) \_\_\_\_\_ were received with bubble >6 mm in diameter, (Notify PM)

**16. SAMPLE PRESERVATION**

Sample(s) \_\_\_\_\_ were further preserved in the laboratory.  
 Time preserved: \_\_\_\_\_ Preservative(s) added/Lot number(s): \_\_\_\_\_

**TestAmerica Multiple Cooler Receipt Form/Narrative  
Canton Facility**

Login #: 09080

Temperature readings: \_\_\_\_\_

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
DAY 3 Q1 (QUENCH 1)	240-69080-G-1	Plastic 250ml - with Sodium Hydroxide	>12	_____	_____
DAY 3 Q1 (QUENCH 1)	240-69080-I-1	Plastic 500ml - with Nitric Acid	<2	_____	_____
DAY 3 Q1 (QUENCH 1)	240-69080-J-1	Plastic 500ml - with Zn Acetate and	>9	_____	_____
DAY 3 Q2 (QUENCH 10)	240-69080-G-2	Plastic 250ml - with Sodium Hydroxide	>12	_____	_____
DAY 3 Q2 (QUENCH 10)	240-69080-I-2	Plastic 500ml - with Nitric Acid	<2	_____	_____
DAY 3 Q2 (QUENCH 10)	240-69080-J-2	Plastic 500ml - with Zn Acetate and	>9	_____	_____
DAY 3 Q3 (QUENCH 20)	240-69080-G-3	Plastic 250ml - with Sodium Hydroxide	>12	_____	_____
DAY 3 Q3 (QUENCH 20)	240-69080-I-3	Plastic 500ml - with Nitric Acid	<2	_____	_____
DAY 3 Q3 (QUENCH 20)	240-69080-J-3	Plastic 500ml - with Zn Acetate and	>9	_____	_____

## Login Sample Receipt Checklist

Client: Environmental Quality Mgt., Inc.

Job Number: 240-69080-1

Login Number: 69080

List Number: 2

Creator: Stvartak, Anthony Q

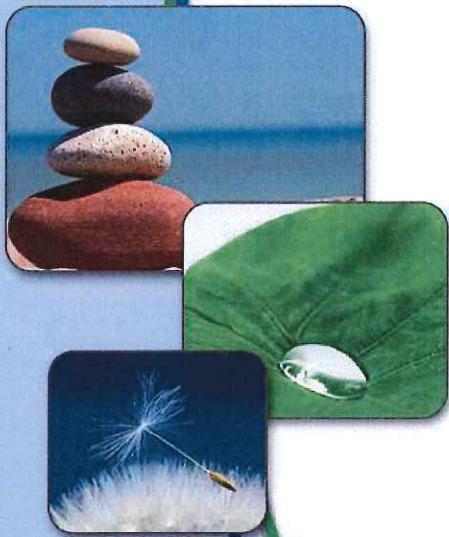
List Source: TestAmerica Nashville

List Creation: 09/07/16 01:38 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

4101 Shuffel Street NW

North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-69014-1

Client Project/Site: AK Steel-Stack Testing Quench Towers

For:

Environmental Quality Mgt., Inc.

1800 Carillon Blvd

Cincinnati, Ohio 45240

Attn: Ms. Jill Binzer

Authorized for release by:

9/26/2016 11:13:42 AM

Opal Johnson, Project Manager II

(330)497-9396

[opal.johnson@testamericainc.com](mailto:opal.johnson@testamericainc.com)

### LINKS

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results through

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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## Definitions/Glossary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Qualifiers

#### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
*	LCS or LCSD is outside acceptance limits.

#### GC/MS Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

#### GC/MS Semi VOA TICs

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

#### HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

#### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

#### General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

## Case Narrative

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Job ID: 240-69014-1**

**Laboratory: TestAmerica Canton**

Narrative

### CASE NARRATIVE

**Client: Environmental Quality Mgt., Inc.**

**Project: AK Steel-Stack Testing Quench Towers**

**Report Number: 240-69014-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

The 610 PAH analysis was performed at the TestAmerica Nashville Laboratory. The 1613B Dioxin/Furans analysis was performed at the TestAmerica Knoxville Laboratory.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

#### RECEIPT

The samples were received on 9/2/2016 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.5° C, 3.2° C and 3.9° C.

EXCEPT: Trip Blank was listed on the COC; but not analyzed per client request.

#### VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2), and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 09/08/2016.

The laboratory control sample (LCS) for analytical batch 240-245997 recovered outside control limits for multiple analytes: These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2), DAY 2 Q3 (QUENCH 20) (240-69014-3), and (LCS 240-245997/4)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



## Case Narrative

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Job ID: 240-69014-1 (Continued)

#### Laboratory: TestAmerica Canton (Continued)

##### **SEMVOLATILE ORGANIC COMPOUNDS (GCMS)**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for semivolatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8270C. The samples were prepared on 09/06/2016 and analyzed on 09/08/2016.

Surrogates are added during the extraction process prior to dilution. When the sample is diluted, surrogate recoveries are diluted out and no corrective action is required.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 240-245545.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### **POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for polycyclic aromatic hydrocarbons (PAHs) in accordance with EPA Method 610. The samples were prepared on 09/04/2016 and analyzed on 09/07/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### **FORMALDEHYDE**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for formaldehyde in accordance with SW846 Method 8315A. The samples were prepared on 09/03/2016 and analyzed on 09/05/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### **TOTAL RECOVERABLE METALS (ICP)**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for total recoverable metals (ICP) in accordance with EPA Method 200.7. The samples were prepared on 09/06/2016 and 09/08/2016 and analyzed on 09/07/2016 and 09/09/2016.

Beryllium was detected in method blank MB 240-246007/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### **MERCURY**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for mercury in accordance with EPA Method 245.1. The samples were prepared on 09/06/2016 and analyzed on 09/07/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### **TOTAL DISSOLVED SOLIDS**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for total dissolved solids in accordance with SM 2540C. The samples were analyzed on 09/06/2016.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

##### **TOTAL CYANIDE**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for total cyanide in accordance with EPA SW-846 Method 9012B. The samples were prepared and analyzed on 09/06/2016.

## Case Narrative

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Job ID: 240-69014-1 (Continued)

#### Laboratory: TestAmerica Canton (Continued)

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 240-245668 and analytical batch 240-245689 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **ANIONS**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for anions in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/07/2016.

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1)[5X], DAY 2 Q2 (QUENCH 10) (240-69014-2)[5X] and DAY 2 Q3 (QUENCH 20) (240-69014-3)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **SULFIDE**

Samples DAY 2 Q1 (QUENCH 1 AND 2) (240-69014-1), DAY 2 Q2 (QUENCH 10) (240-69014-2) and DAY 2 Q3 (QUENCH 20) (240-69014-3) were analyzed for sulfide in accordance with SM 4500 S2 E. The samples were analyzed on 09/06/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 245602.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Method Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
610	PAHs (HPLC)	40CFR136A	TAL NSH
8315A	Carbonyl Compounds by HPLC	SW846	TAL CAN
200.7 Rev 4.4	Metals (ICP)	EPA	TAL CAN
245.1	Mercury (CVAA)	EPA	TAL CAN
4500 S2 F-2000	Sulfide, Total	SM	TAL CAN
9012B	Cyanide, Total andor Amenable	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CAN

### Protocol References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

## Sample Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Water	08/31/16 10:30	09/02/16 09:00
240-69014-2	DAY 2 Q2 (QUENCH 10)	Water	08/31/16 13:03	09/02/16 09:00
240-69014-3	DAY 2 Q3 (QUENCH 20)	Water	08/31/16 16:21	09/02/16 09:00

1  
2  
3  
4  
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10  
11  
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13  
14  
15  
16

## Detection Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Lab Sample ID: 240-69014-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.90		0.19	0.040	ug/L	1	8270C		Total/NA
Phenanthrene	0.11	J	0.19	0.029	ug/L	1	8270C		Total/NA
Benzo[a]anthracene	0.072	J	0.19	0.019	ug/L	1	610		Total/NA
Benzo[b]fluoranthene	0.12		0.093	0.019	ug/L	1	610		Total/NA
Benzo[k]fluoranthene	0.047	J	0.13	0.019	ug/L	1	610		Total/NA
Benzo[a]pyrene	0.13		0.093	0.019	ug/L	1	610		Total/NA
Chrysene	0.11	p	0.093	0.019	ug/L	1	610		Total/NA
Fluoranthene	0.20		0.19	0.028	ug/L	1	610		Total/NA
Indeno[1,2,3-cd]pyrene	0.080	J p	0.19	0.037	ug/L	1	610		Total/NA
Phenanthrene	0.085	J p	0.47	0.047	ug/L	1	610		Total/NA
Pyrene	0.15	J	0.19	0.028	ug/L	1	610		Total/NA
Antimony	5.7	J	10	3.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Arsenic	54		10	3.3	ug/L	1	200.7 Rev 4.4		Total Recoverable
Beryllium	0.37	J	5.0	0.21	ug/L	1	200.7 Rev 4.4		Total Recoverable
Chromium	2.9	J	5.0	0.55	ug/L	1	200.7 Rev 4.4		Total Recoverable
Cobalt	1.4	J	7.0	0.84	ug/L	1	200.7 Rev 4.4		Total Recoverable
Manganese	49		15	5.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Nickel	7.5	J	40	1.6	ug/L	1	200.7 Rev 4.4		Total Recoverable
Selenium	6.1	J	15	5.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Chloride	270		5.0	2.0	mg/L	5	9056A		Total/NA
Fluoride	0.87	J	1.0	0.0090	mg/L	1	9056A		Total/NA
Sulfate	300		5.0	0.65	mg/L	5	9056A		Total/NA
Total Dissolved Solids	920		20	15	mg/L	1	SM 2540C		Total/NA

**Client Sample ID: DAY 2 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69014-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoranthene	0.10	J	0.19	0.025	ug/L	1	8270C		Total/NA
Naphthalene	0.16	J	0.19	0.040	ug/L	1	8270C		Total/NA
Phenanthrene	0.20		0.19	0.029	ug/L	1	8270C		Total/NA
Pyrene	0.12	J	0.19	0.026	ug/L	1	8270C		Total/NA
Benzo[a]anthracene	0.073	J	0.19	0.019	ug/L	1	610		Total/NA
Benzo[b]fluoranthene	0.078	J	0.093	0.019	ug/L	1	610		Total/NA
Benzo[g,h,i]perylene	0.060	J p	0.19	0.019	ug/L	1	610		Total/NA
Benzo[a]pyrene	0.070	J	0.093	0.019	ug/L	1	610		Total/NA
Chrysene	0.11	p	0.093	0.019	ug/L	1	610		Total/NA
Fluoranthene	0.20	p	0.19	0.028	ug/L	1	610		Total/NA
Phenanthrene	0.26	J	0.47	0.047	ug/L	1	610		Total/NA
Pyrene	0.40		0.19	0.028	ug/L	1	610		Total/NA
Antimony	8.5	J	10	3.1	ug/L	1	200.7 Rev 4.4		Total Recoverable
Arsenic	55		10	3.3	ug/L	1	200.7 Rev 4.4		Total Recoverable
Beryllium	0.31	J	5.0	0.21	ug/L	1	200.7 Rev 4.4		Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

## Detection Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Client Sample ID: DAY 2 Q2 (QUENCH 10) (Continued)

### Lab Sample ID: 240-69014-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	2.0	J	5.0	0.55	ug/L	1		200.7 Rev 4.4	Total Recoverable
Cobalt	1.1	J	7.0	0.84	ug/L	1		200.7 Rev 4.4	Total Recoverable
Manganese	51		15	5.1	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	6.7	J	40	1.6	ug/L	1		200.7 Rev 4.4	Total Recoverable
Selenium	10	J	15	5.1	ug/L	1		200.7 Rev 4.4	Total Recoverable
Chloride	280		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.87	J	1.0	0.0090	mg/L	1		9056A	Total/NA
Sulfate	310		5.0	0.65	mg/L	5		9056A	Total/NA
Total Dissolved Solids	940		20	15	mg/L	1		SM 2540C	Total/NA

### Client Sample ID: DAY 2 Q3 (QUENCH 20)

### Lab Sample ID: 240-69014-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.079	J	0.19	0.040	ug/L	1		8270C	Total/NA
Phenanthrene	0.15	J	0.19	0.029	ug/L	1		8270C	Total/NA
Acenaphthene	0.16	J p	0.93	0.16	ug/L	1		610	Total/NA
Benzo[a]anthracene	0.068	J p	0.19	0.019	ug/L	1		610	Total/NA
Benzo[b]fluoranthene	0.094		0.093	0.019	ug/L	1		610	Total/NA
Benzo[a]pyrene	0.069	J p	0.093	0.019	ug/L	1		610	Total/NA
Chrysene	0.17	p	0.093	0.019	ug/L	1		610	Total/NA
Fluoranthene	0.34		0.19	0.028	ug/L	1		610	Total/NA
Indeno[1,2,3-cd]pyrene	0.048	J p	0.19	0.037	ug/L	1		610	Total/NA
Phenanthrene	0.26	J	0.47	0.047	ug/L	1		610	Total/NA
Pyrene	0.45		0.19	0.028	ug/L	1		610	Total/NA
Antimony	7.1	J	10	3.1	ug/L	1		200.7 Rev 4.4	Total Recoverable
Arsenic	49		10	3.3	ug/L	1		200.7 Rev 4.4	Total Recoverable
Chromium	2.0	J	5.0	0.55	ug/L	1		200.7 Rev 4.4	Total Recoverable
Cobalt	1.0	J	7.0	0.84	ug/L	1		200.7 Rev 4.4	Total Recoverable
Manganese	58		15	5.1	ug/L	1		200.7 Rev 4.4	Total Recoverable
Nickel	6.5	J	40	1.6	ug/L	1		200.7 Rev 4.4	Total Recoverable
Selenium	9.1	J	15	5.1	ug/L	1		200.7 Rev 4.4	Total Recoverable
Chloride	270		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.78	J	1.0	0.0090	mg/L	1		9056A	Total/NA
Sulfate	300		5.0	0.65	mg/L	5		9056A	Total/NA
Total Dissolved Solids	950		20	15	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Lab Sample ID: 240-69014-1**

Date Collected: 08/31/16 10:30

Matrix: Water

Date Received: 09/02/16 09:00

## Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L		09/08/16 18:02	09/08/16 18:02	1
Benzene	1.0	U	1.0	0.35	ug/L		09/08/16 18:02	09/08/16 18:02	1
Bromoform	1.0	U	1.0	0.56	ug/L		09/08/16 18:02	09/08/16 18:02	1
Bromomethane	1.0	U *	1.0	0.44	ug/L		09/08/16 18:02	09/08/16 18:02	1
Carbon disulfide	1.0	U	1.0	0.38	ug/L		09/08/16 18:02	09/08/16 18:02	1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L		09/08/16 18:02	09/08/16 18:02	1
Chlorobenzene	1.0	U	1.0	0.25	ug/L		09/08/16 18:02	09/08/16 18:02	1
Chloroethane	1.0	U *	1.0	0.32	ug/L		09/08/16 18:02	09/08/16 18:02	1
Chloroform	1.0	U	1.0	0.25	ug/L		09/08/16 18:02	09/08/16 18:02	1
Chloromethane	1.0	U	1.0	0.44	ug/L		09/08/16 18:02	09/08/16 18:02	1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L		09/08/16 18:02	09/08/16 18:02	1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L		09/08/16 18:02	09/08/16 18:02	1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L		09/08/16 18:02	09/08/16 18:02	1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L		09/08/16 18:02	09/08/16 18:02	1
Ethylbenzene	1.0	U	1.0	0.25	ug/L		09/08/16 18:02	09/08/16 18:02	1
Iodomethane	1.0	U	1.0	0.42	ug/L		09/08/16 18:02	09/08/16 18:02	1
Methylene Chloride	1.0	U	1.0	0.33	ug/L		09/08/16 18:02	09/08/16 18:02	1
Styrene	1.0	U	1.0	0.45	ug/L		09/08/16 18:02	09/08/16 18:02	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L		09/08/16 18:02	09/08/16 18:02	1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L		09/08/16 18:02	09/08/16 18:02	1
Toluene	1.0	U	1.0	0.23	ug/L		09/08/16 18:02	09/08/16 18:02	1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L		09/08/16 18:02	09/08/16 18:02	1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L		09/08/16 18:02	09/08/16 18:02	1
Trichloroethene	1.0	U	1.0	0.22	ug/L		09/08/16 18:02	09/08/16 18:02	1
Vinyl chloride	1.0	U	1.0	0.29	ug/L		09/08/16 18:02	09/08/16 18:02	1
Xylenes, Total	2.0	U	2.0	0.52	ug/L		09/08/16 18:02	09/08/16 18:02	1

## Surrogate

	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		73 - 120		09/08/16 18:02	1
Dibromofluoromethane (Surr)	93		80 - 120		09/08/16 18:02	1
1,2-Dichloroethane-d4 (Surr)	89		63 - 132		09/08/16 18:02	1
Toluene-d8 (Surr)	90		73 - 124		09/08/16 18:02	1

## Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.19	U	0.19	0.041	ug/L		09/06/16 07:58	09/08/16 10:18	1
Acenaphthylene	0.19	U	0.19	0.019	ug/L		09/06/16 07:58	09/08/16 10:18	1
Anthracene	0.19	U	0.19	0.029	ug/L		09/06/16 07:58	09/08/16 10:18	1
Benzo[a]anthracene	0.19	U	0.19	0.055	ug/L		09/06/16 07:58	09/08/16 10:18	1
Benzo[b]fluoranthene	0.19	U	0.19	0.055	ug/L		09/06/16 07:58	09/08/16 10:18	1
Benzo[k]fluoranthene	0.19	U	0.19	0.044	ug/L		09/06/16 07:58	09/08/16 10:18	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.046	ug/L		09/06/16 07:58	09/08/16 10:18	1
Benzo[a]pyrene	0.19	U	0.19	0.028	ug/L		09/06/16 07:58	09/08/16 10:18	1
Chrysene	0.19	U	0.19	0.032	ug/L		09/06/16 07:58	09/08/16 10:18	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.037	ug/L		09/06/16 07:58	09/08/16 10:18	1
Fluoranthene	0.19	U	0.19	0.025	ug/L		09/06/16 07:58	09/08/16 10:18	1
Fluorene	0.19	U	0.19	0.031	ug/L		09/06/16 07:58	09/08/16 10:18	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.044	ug/L		09/06/16 07:58	09/08/16 10:18	1
<b>Naphthalene</b>	<b>0.90</b>		0.19	0.040	ug/L		09/06/16 07:58	09/08/16 10:18	1
<b>Phenanthrene</b>	<b>0.11</b>	<b>J</b>	0.19	0.029	ug/L		09/06/16 07:58	09/08/16 10:18	1

TestAmerica Canton

## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Lab Sample ID: 240-69014-1**

Date Collected: 08/31/16 10:30

Matrix: Water

Date Received: 09/02/16 09:00

### Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	0.19	U	0.19	0.026	ug/L		09/06/16 07:58	09/08/16 10:18	1
<b>Tentatively Identified Compound</b>	<b>Est. Result</b>	<b>Qualifier</b>				<b>D</b>	<b>RT</b>	<b>CAS No.</b>	
Perylene TIC	9.3	U			ug/L			198-55-0	09/06/16 07:58
									09/08/16 10:18
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>			<b>Limits</b>			<b>Prepared</b>	<b>Analyzed</b>
2-Fluorobiphenyl (Surr)	63				44 - 120			09/06/16 07:58	09/08/16 10:18
2-Fluorophenol (Surr)	65				26 - 120			09/06/16 07:58	09/08/16 10:18
2,4,6-Tribromophenol (Surr)	61				36 - 120			09/06/16 07:58	09/08/16 10:18
Nitrobenzene-d5 (Surr)	59				44 - 120			09/06/16 07:58	09/08/16 10:18
Phenol-d5 (Surr)	37				16 - 120			09/06/16 07:58	09/08/16 10:18
Terphenyl-d14 (Surr)	76				43 - 120			09/06/16 07:58	09/08/16 10:18

### Method: 610 - PAHs (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.93	U	0.93	0.16	ug/L		09/04/16 18:43	09/07/16 09:16	1
Acenaphthylene	0.93	U	0.93	0.21	ug/L		09/04/16 18:43	09/07/16 09:16	1
Anthracene	0.93	U	0.93	0.093	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Benzo[a]anthracene</b>	<b>0.072</b>	<b>J</b>	0.19	0.019	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Benzo[b]fluoranthene</b>	<b>0.12</b>		0.093	0.019	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Benzo[k]fluoranthene</b>	<b>0.047</b>	<b>J</b>	0.13	0.019	ug/L		09/04/16 18:43	09/07/16 09:16	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.019	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Benzo[a]pyrene</b>	<b>0.13</b>		0.093	0.019	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Chrysene</b>	<b>0.11</b>	<b>p</b>	0.093	0.019	ug/L		09/04/16 18:43	09/07/16 09:16	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.028	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Fluoranthene</b>	<b>0.20</b>		0.19	0.028	ug/L		09/04/16 18:43	09/07/16 09:16	1
Fluorene	0.47	U	0.47	0.037	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Indeno[1,2,3-cd]pyrene</b>	<b>0.080</b>	<b>J p</b>	0.19	0.037	ug/L		09/04/16 18:43	09/07/16 09:16	1
Naphthalene	0.93	U	0.93	0.32	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Phenanthrene</b>	<b>0.085</b>	<b>J p</b>	0.47	0.047	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Pyrene</b>	<b>0.15</b>	<b>J</b>	0.19	0.028	ug/L		09/04/16 18:43	09/07/16 09:16	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>			<b>Limits</b>			<b>Prepared</b>	<b>Analyzed</b>
p-Terphenyl	72				52 - 135			09/04/16 18:43	09/07/16 09:16
									1

### Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/03/16 08:35	09/05/16 14:13	1

### Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.7	J	10	3.1	ug/L		09/08/16 14:00	09/09/16 14:29	1
Arsenic	54		10	3.3	ug/L		09/06/16 14:00	09/07/16 23:41	1
Beryllium	0.37	J	5.0	0.21	ug/L		09/06/16 14:00	09/07/16 23:41	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/07/16 23:41	1
Chromium	2.9	J	5.0	0.55	ug/L		09/06/16 14:00	09/07/16 23:41	1
Cobalt	1.4	J	7.0	0.84	ug/L		09/06/16 14:00	09/07/16 23:41	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/07/16 23:41	1
Manganese	49		15	5.1	ug/L		09/06/16 14:00	09/07/16 23:41	1
Nickel	7.5	J	40	1.6	ug/L		09/06/16 14:00	09/07/16 23:41	1
Selenium	6.1	J	15	5.1	ug/L		09/06/16 14:00	09/07/16 23:41	1

TestAmerica Canton

## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### **Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 10:58	1

### **General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 13:09	09/06/16 13:09	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L		09/06/16 13:09	09/06/16 13:09	1
Cyanide, Total	0.010	U	0.010	0.0050	mg/L	09/06/16 14:27	09/06/16 16:05	09/06/16 16:05	1
<b>Chloride</b>	<b>270</b>		5.0	2.0	mg/L		09/07/16 05:25	09/07/16 05:25	5
Fluoride	0.87	J	1.0	0.0090	mg/L		09/07/16 04:24	09/07/16 04:24	1
Sulfate	300		5.0	0.65	mg/L		09/07/16 05:25	09/07/16 05:25	5
Total Dissolved Solids	920		20	15	mg/L		09/06/16 15:10	09/06/16 15:10	1



TestAmerica Canton

## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69014-2**

Date Collected: 08/31/16 13:03

Matrix: Water

Date Received: 09/02/16 09:00

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L		09/08/16 18:24		1
Benzene	1.0	U	1.0	0.35	ug/L		09/08/16 18:24		1
Bromoform	1.0	U	1.0	0.56	ug/L		09/08/16 18:24		1
Bromomethane	1.0	U *	1.0	0.44	ug/L		09/08/16 18:24		1
Carbon disulfide	1.0	U	1.0	0.38	ug/L		09/08/16 18:24		1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L		09/08/16 18:24		1
Chlorobenzene	1.0	U	1.0	0.25	ug/L		09/08/16 18:24		1
Chloroethane	1.0	U *	1.0	0.32	ug/L		09/08/16 18:24		1
Chloroform	1.0	U	1.0	0.25	ug/L		09/08/16 18:24		1
Chloromethane	1.0	U	1.0	0.44	ug/L		09/08/16 18:24		1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L		09/08/16 18:24		1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L		09/08/16 18:24		1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L		09/08/16 18:24		1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L		09/08/16 18:24		1
Ethylbenzene	1.0	U	1.0	0.25	ug/L		09/08/16 18:24		1
Iodomethane	1.0	U	1.0	0.42	ug/L		09/08/16 18:24		1
Methylene Chloride	1.0	U	1.0	0.33	ug/L		09/08/16 18:24		1
Styrene	1.0	U	1.0	0.45	ug/L		09/08/16 18:24		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L		09/08/16 18:24		1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L		09/08/16 18:24		1
Toluene	1.0	U	1.0	0.23	ug/L		09/08/16 18:24		1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L		09/08/16 18:24		1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L		09/08/16 18:24		1
Trichloroethene	1.0	U	1.0	0.22	ug/L		09/08/16 18:24		1
Vinyl chloride	1.0	U	1.0	0.29	ug/L		09/08/16 18:24		1
Xylenes, Total	2.0	U	2.0	0.52	ug/L		09/08/16 18:24		1

### Surrogate

	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		73 - 120		09/08/16 18:24	1
Dibromofluoromethane (Surr)	93		80 - 120		09/08/16 18:24	1
1,2-Dichloroethane-d4 (Surr)	86		63 - 132		09/08/16 18:24	1
Toluene-d8 (Surr)	90		73 - 124		09/08/16 18:24	1

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.19	U	0.19	0.041	ug/L		09/06/16 07:58	09/08/16 09:53	1
Acenaphthylene	0.19	U	0.19	0.019	ug/L		09/06/16 07:58	09/08/16 09:53	1
Anthracene	0.19	U	0.19	0.029	ug/L		09/06/16 07:58	09/08/16 09:53	1
Benzo[a]anthracene	0.19	U	0.19	0.055	ug/L		09/06/16 07:58	09/08/16 09:53	1
Benzo[b]fluoranthene	0.19	U	0.19	0.055	ug/L		09/06/16 07:58	09/08/16 09:53	1
Benzo[k]fluoranthene	0.19	U	0.19	0.044	ug/L		09/06/16 07:58	09/08/16 09:53	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.046	ug/L		09/06/16 07:58	09/08/16 09:53	1
Benzo[a]pyrene	0.19	U	0.19	0.028	ug/L		09/06/16 07:58	09/08/16 09:53	1
Chrysene	0.19	U	0.19	0.032	ug/L		09/06/16 07:58	09/08/16 09:53	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.037	ug/L		09/06/16 07:58	09/08/16 09:53	1
<b>Fluoranthene</b>	<b>0.10</b>	<b>J</b>	0.19	0.025	ug/L		09/06/16 07:58	09/08/16 09:53	1
Fluorene	0.19	U	0.19	0.031	ug/L		09/06/16 07:58	09/08/16 09:53	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.044	ug/L		09/06/16 07:58	09/08/16 09:53	1
<b>Naphthalene</b>	<b>0.16</b>	<b>J</b>	0.19	0.040	ug/L		09/06/16 07:58	09/08/16 09:53	1
Phenanthrene	0.20		0.19	0.029	ug/L		09/06/16 07:58	09/08/16 09:53	1

TestAmerica Canton

# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69014-2**

Date Collected: 08/31/16 13:03

Matrix: Water

Date Received: 09/02/16 09:00

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	0.12	J	0.19	0.026	ug/L		09/06/16 07:58	09/08/16 09:53	1
Tentatively Identified Compound	Est. Result	Qualifier	Unit			D	RT	CAS No.	Prepared Analyzed Dil Fac
Perylene TIC	9.3	U	ug/L					198-55-0	09/06/16 07:58 09/08/16 09:53 1
Surrogate	%Recovery	Qualifier	Limits					Prepared Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	55		44 - 120					09/06/16 07:58 09/08/16 09:53	1
2-Fluorophenol (Surr)	50		26 - 120					09/06/16 07:58 09/08/16 09:53	1
2,4,6-Tribromophenol (Surr)	54		36 - 120					09/06/16 07:58 09/08/16 09:53	1
Nitrobenzene-d5 (Surr)	51		44 - 120					09/06/16 07:58 09/08/16 09:53	1
Phenol-d5 (Surr)	32		16 - 120					09/06/16 07:58 09/08/16 09:53	1
Terphenyl-d14 (Surr)	70		43 - 120					09/06/16 07:58 09/08/16 09:53	1

## Method: 610 - PAHs (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.93	U	0.93	0.16	ug/L		09/04/16 18:43	09/07/16 09:40	1
Acenaphthylene	0.93	U	0.93	0.21	ug/L		09/04/16 18:43	09/07/16 09:40	1
Anthracene	0.93	U	0.93	0.093	ug/L		09/04/16 18:43	09/07/16 09:40	1
Benzo[a]anthracene	0.073	J	0.19	0.019	ug/L		09/04/16 18:43	09/07/16 09:40	1
Benzo[b]fluoranthene	0.078	J	0.093	0.019	ug/L		09/04/16 18:43	09/07/16 09:40	1
Benzo[k]fluoranthene	0.13	U	0.13	0.019	ug/L		09/04/16 18:43	09/07/16 09:40	1
Benzo[g,h,i]perylene	0.060	J p	0.19	0.019	ug/L		09/04/16 18:43	09/07/16 09:40	1
Benzo[a]pyrene	0.070	J	0.093	0.019	ug/L		09/04/16 18:43	09/07/16 09:40	1
Chrysene	0.11	p	0.093	0.019	ug/L		09/04/16 18:43	09/07/16 09:40	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.028	ug/L		09/04/16 18:43	09/07/16 09:40	1
Fluoranthene	0.20	p	0.19	0.028	ug/L		09/04/16 18:43	09/07/16 09:40	1
Fluorene	0.47	U	0.47	0.037	ug/L		09/04/16 18:43	09/07/16 09:40	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.037	ug/L		09/04/16 18:43	09/07/16 09:40	1
Naphthalene	0.93	U	0.93	0.32	ug/L		09/04/16 18:43	09/07/16 09:40	1
Phenanthrene	0.26	J	0.47	0.047	ug/L		09/04/16 18:43	09/07/16 09:40	1
Pyrene	0.40		0.19	0.028	ug/L		09/04/16 18:43	09/07/16 09:40	1
Surrogate	%Recovery	Qualifier	Limits					Prepared Analyzed	Dil Fac
p-Terphenyl	82		52 - 135					09/04/16 18:43 09/07/16 09:40	1

## Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/03/16 08:35	09/05/16 14:22	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	8.5	J	10	3.1	ug/L		09/08/16 14:00	09/09/16 14:33	1
Arsenic	55		10	3.3	ug/L		09/06/16 14:00	09/07/16 23:53	1
Beryllium	0.31	J	5.0	0.21	ug/L		09/06/16 14:00	09/07/16 23:53	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/07/16 23:53	1
Chromium	2.0	J	5.0	0.55	ug/L		09/06/16 14:00	09/07/16 23:53	1
Cobalt	1.1	J	7.0	0.84	ug/L		09/06/16 14:00	09/07/16 23:53	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/07/16 23:53	1
Manganese	51		15	5.1	ug/L		09/06/16 14:00	09/07/16 23:53	1
Nickel	6.7	J	40	1.6	ug/L		09/06/16 14:00	09/07/16 23:53	1
Selenium	10	J	15	5.1	ug/L		09/06/16 14:00	09/07/16 23:53	1

TestAmerica Canton

## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### **Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 11:05	1

### **General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 13:19	09/06/16 13:19	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L		09/06/16 13:19	09/06/16 13:19	1
Cyanide, Total	0.010	U	0.010	0.0050	mg/L	09/06/16 14:27	09/06/16 16:05	09/06/16 16:05	1
<b>Chloride</b>	<b>280</b>		5.0	2.0	mg/L		09/07/16 06:05	09/07/16 06:05	5
Fluoride	0.87	J	1.0	0.0090	mg/L		09/07/16 05:45	09/07/16 05:45	1
Sulfate	310		5.0	0.65	mg/L		09/07/16 06:05	09/07/16 06:05	5
Total Dissolved Solids	940		20	15	mg/L		09/06/16 15:10	09/06/16 15:10	1



## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q3 (QUENCH 20)**

**Lab Sample ID: 240-69014-3**

Date Collected: 08/31/16 16:21

Matrix: Water

Date Received: 09/02/16 09:00

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L		09/08/16 18:46		1
Benzene	1.0	U	1.0	0.35	ug/L		09/08/16 18:46		1
Bromoform	1.0	U	1.0	0.56	ug/L		09/08/16 18:46		1
Bromomethane	1.0	U*	1.0	0.44	ug/L		09/08/16 18:46		1
Carbon disulfide	1.0	U	1.0	0.38	ug/L		09/08/16 18:46		1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L		09/08/16 18:46		1
Chlorobenzene	1.0	U	1.0	0.25	ug/L		09/08/16 18:46		1
Chloroethane	1.0	U*	1.0	0.32	ug/L		09/08/16 18:46		1
Chloroform	1.0	U	1.0	0.25	ug/L		09/08/16 18:46		1
Chloromethane	1.0	U	1.0	0.44	ug/L		09/08/16 18:46		1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L		09/08/16 18:46		1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L		09/08/16 18:46		1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L		09/08/16 18:46		1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L		09/08/16 18:46		1
Ethylbenzene	1.0	U	1.0	0.25	ug/L		09/08/16 18:46		1
Iodomethane	1.0	U	1.0	0.42	ug/L		09/08/16 18:46		1
Methylene Chloride	1.0	U	1.0	0.33	ug/L		09/08/16 18:46		1
Styrene	1.0	U	1.0	0.45	ug/L		09/08/16 18:46		1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L		09/08/16 18:46		1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L		09/08/16 18:46		1
Toluene	1.0	U	1.0	0.23	ug/L		09/08/16 18:46		1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L		09/08/16 18:46		1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L		09/08/16 18:46		1
Trichloroethene	1.0	U	1.0	0.22	ug/L		09/08/16 18:46		1
Vinyl chloride	1.0	U	1.0	0.29	ug/L		09/08/16 18:46		1
Xylenes, Total	2.0	U	2.0	0.52	ug/L		09/08/16 18:46		1

### Surrogate

	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		73 - 120		09/08/16 18:46	1
Dibromofluoromethane (Surr)	95		80 - 120		09/08/16 18:46	1
1,2-Dichloroethane-d4 (Surr)	89		63 - 132		09/08/16 18:46	1
Toluene-d8 (Surr)	91		73 - 124		09/08/16 18:46	1

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.19	U	0.19	0.041	ug/L		09/06/16 07:58	09/08/16 09:28	1
Acenaphthylene	0.19	U	0.19	0.019	ug/L		09/06/16 07:58	09/08/16 09:28	1
Anthracene	0.19	U	0.19	0.029	ug/L		09/06/16 07:58	09/08/16 09:28	1
Benzo[a]anthracene	0.19	U	0.19	0.055	ug/L		09/06/16 07:58	09/08/16 09:28	1
Benzo[b]fluoranthene	0.19	U	0.19	0.055	ug/L		09/06/16 07:58	09/08/16 09:28	1
Benzo[k]fluoranthene	0.19	U	0.19	0.044	ug/L		09/06/16 07:58	09/08/16 09:28	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.046	ug/L		09/06/16 07:58	09/08/16 09:28	1
Benzo[a]pyrene	0.19	U	0.19	0.028	ug/L		09/06/16 07:58	09/08/16 09:28	1
Chrysene	0.19	U	0.19	0.032	ug/L		09/06/16 07:58	09/08/16 09:28	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.037	ug/L		09/06/16 07:58	09/08/16 09:28	1
Fluoranthene	0.19	U	0.19	0.025	ug/L		09/06/16 07:58	09/08/16 09:28	1
Fluorene	0.19	U	0.19	0.031	ug/L		09/06/16 07:58	09/08/16 09:28	1
Indeno[1,2,3-cd]pyrene	0.19	U	0.19	0.044	ug/L		09/06/16 07:58	09/08/16 09:28	1
<b>Naphthalene</b>	<b>0.079</b>	<b>J</b>	0.19	0.040	ug/L		09/06/16 07:58	09/08/16 09:28	1
<b>Phenanthrene</b>	<b>0.15</b>	<b>J</b>	0.19	0.029	ug/L		09/06/16 07:58	09/08/16 09:28	1

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# Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q3 (QUENCH 20)**

**Lab Sample ID: 240-69014-3**

Date Collected: 08/31/16 16:21

Matrix: Water

Date Received: 09/02/16 09:00

## Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Pyrene	0.19	U	0.19	0.026	ug/L		09/06/16 07:58	09/08/16 09:28	1
<b>Tentatively Identified Compound</b>									
Perylene TIC	9.3	U			ug/L		198-55-0	09/06/16 07:58	09/08/16 09:28
<b>Surrogate</b>									
2-Fluorobiphenyl (Surr)	61		44 - 120				09/06/16 07:58	09/08/16 09:28	1
2-Fluorophenol (Surr)	59		26 - 120				09/06/16 07:58	09/08/16 09:28	1
2,4,6-Tribromophenol (Surr)	60		36 - 120				09/06/16 07:58	09/08/16 09:28	1
Nitrobenzene-d5 (Surr)	60		44 - 120				09/06/16 07:58	09/08/16 09:28	1
Phenol-d5 (Surr)	38		16 - 120				09/06/16 07:58	09/08/16 09:28	1
Terphenyl-d14 (Surr)	71		43 - 120				09/06/16 07:58	09/08/16 09:28	1

## Method: 610 - PAHs (HPLC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.16	J p	0.93	0.16	ug/L		09/04/16 18:43	09/07/16 10:05	1
Acenaphthylene	0.93	U	0.93	0.21	ug/L		09/04/16 18:43	09/07/16 10:05	1
Anthracene	0.93	U	0.93	0.093	ug/L		09/04/16 18:43	09/07/16 10:05	1
Benzo[a]anthracene	0.068	J p	0.19	0.019	ug/L		09/04/16 18:43	09/07/16 10:05	1
Benzo[b]fluoranthene	0.094		0.093	0.019	ug/L		09/04/16 18:43	09/07/16 10:05	1
Benzo[k]fluoranthene	0.13	U	0.13	0.019	ug/L		09/04/16 18:43	09/07/16 10:05	1
Benzo[g,h,i]perylene	0.19	U	0.19	0.019	ug/L		09/04/16 18:43	09/07/16 10:05	1
Benzo[a]pyrene	0.069	J p	0.093	0.019	ug/L		09/04/16 18:43	09/07/16 10:05	1
Chrysene	0.17	p	0.093	0.019	ug/L		09/04/16 18:43	09/07/16 10:05	1
Dibenz(a,h)anthracene	0.19	U	0.19	0.028	ug/L		09/04/16 18:43	09/07/16 10:05	1
Fluoranthene	0.34		0.19	0.028	ug/L		09/04/16 18:43	09/07/16 10:05	1
Fluorene	0.47	U	0.47	0.037	ug/L		09/04/16 18:43	09/07/16 10:05	1
Indeno[1,2,3-cd]pyrene	0.048	J p	0.19	0.037	ug/L		09/04/16 18:43	09/07/16 10:05	1
Naphthalene	0.93	U	0.93	0.32	ug/L		09/04/16 18:43	09/07/16 10:05	1
Phenanthrene	0.26	J	0.47	0.047	ug/L		09/04/16 18:43	09/07/16 10:05	1
Pyrene	0.45		0.19	0.028	ug/L		09/04/16 18:43	09/07/16 10:05	1
<b>Surrogate</b>									
p-Terphenyl	83		52 - 135				09/04/16 18:43	09/07/16 10:05	1

## Method: 8315A - Carbonyl Compounds by HPLC

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/03/16 08:35	09/05/16 14:30	1

## Method: 200.7 Rev 4.4 - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	7.1	J	10	3.1	ug/L		09/08/16 14:00	09/09/16 14:37	1
Arsenic	49		10	3.3	ug/L		09/06/16 14:00	09/07/16 23:57	1
Beryllium	5.0	U	5.0	0.21	ug/L		09/06/16 14:00	09/07/16 23:57	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/07/16 23:57	1
Chromium	2.0	J	5.0	0.55	ug/L		09/06/16 14:00	09/07/16 23:57	1
Cobalt	1.0	J	7.0	0.84	ug/L		09/06/16 14:00	09/07/16 23:57	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/07/16 23:57	1
Manganese	58		15	5.1	ug/L		09/06/16 14:00	09/07/16 23:57	1
Nickel	6.5	J	40	1.6	ug/L		09/06/16 14:00	09/07/16 23:57	1
Selenium	9.1	J	15	5.1	ug/L		09/06/16 14:00	09/07/16 23:57	1

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## Client Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### **Method: 245.1 - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 11:07	1

### **General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L		09/06/16 13:28	09/06/16 13:28	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L		09/06/16 13:28	09/06/16 13:28	1
Cyanide, Total	0.010	U	0.010	0.0050	mg/L	09/06/16 14:27	09/06/16 16:05	09/06/16 16:05	1
<b>Chloride</b>	<b>270</b>		5.0	2.0	mg/L		09/07/16 06:45	09/07/16 06:45	5
Fluoride	0.78	J	1.0	0.0090	mg/L		09/07/16 06:25	09/07/16 06:25	1
Sulfate	300		5.0	0.65	mg/L		09/07/16 06:45	09/07/16 06:45	5
Total Dissolved Solids	950		20	15	mg/L		09/06/16 15:10	09/06/16 15:10	1



## Surrogate Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (73-120)	DBFM (80-120)	12DCE (63-132)	TOL (73-124)
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	89	93	89	90
240-69014-2	DAY 2 Q2 (QUENCH 10)	86	93	86	90
240-69014-3	DAY 2 Q3 (QUENCH 20)	89	95	89	91
LCS 240-245997/4	Lab Control Sample	96	92	83	94
MB 240-245997/6	Method Blank	89	90	89	91

#### Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

12DCE = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		FBP (44-120)	2FP (26-120)	TBP (36-120)	NBZ (44-120)	PHL (16-120)	TPH (43-120)
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	63	65	61	59	37	76
240-69014-2	DAY 2 Q2 (QUENCH 10)	55	50	54	51	32	70
240-69014-3	DAY 2 Q3 (QUENCH 20)	61	59	60	60	38	71
LCS 240-245545/20-A	Lab Control Sample	79	65	85	87	41	89
MB 240-245545/19-A	Method Blank	67	52	62	62	29	76

#### Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)

2FP = 2-Fluorophenol (Surr)

TBP = 2,4,6-Tribromophenol (Surr)

NBZ = Nitrobenzene-d5 (Surr)

PHL = Phenol-d5 (Surr)

TPH = Terphenyl-d14 (Surr)

### Method: 610 - PAHs (HPLC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		PTP2 (52-135)					
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	72					
240-69014-2	DAY 2 Q2 (QUENCH 10)	82					
240-69014-3	DAY 2 Q3 (QUENCH 20)	83					
LCS 490-367795/2-A	Lab Control Sample	88					
MB 490-367795/1-A	Method Blank	69					

#### Surrogate Legend

PTP = p-Terphenyl

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# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

## Method: 8260B - Volatile Organic Compounds (GC/MS)

**Lab Sample ID: MB 240-245997/6**

**Matrix: Water**

**Analysis Batch: 245997**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acrylonitrile	20	U	20	6.3	ug/L			09/08/16 14:01	1
Benzene	1.0	U	1.0	0.35	ug/L			09/08/16 14:01	1
Bromoform	1.0	U	1.0	0.56	ug/L			09/08/16 14:01	1
Bromomethane	1.0	U	1.0	0.44	ug/L			09/08/16 14:01	1
Carbon disulfide	1.0	U	1.0	0.38	ug/L			09/08/16 14:01	1
Carbon tetrachloride	1.0	U	1.0	0.43	ug/L			09/08/16 14:01	1
Chlorobenzene	1.0	U	1.0	0.25	ug/L			09/08/16 14:01	1
Chloroethane	1.0	U	1.0	0.32	ug/L			09/08/16 14:01	1
Chloroform	1.0	U	1.0	0.25	ug/L			09/08/16 14:01	1
Chloromethane	1.0	U	1.0	0.44	ug/L			09/08/16 14:01	1
Dichlorobromomethane	1.0	U	1.0	0.29	ug/L			09/08/16 14:01	1
1,2-Dichloroethane	1.0	U	1.0	0.23	ug/L			09/08/16 14:01	1
1,1-Dichloroethene	1.0	U	1.0	0.45	ug/L			09/08/16 14:01	1
1,2-Dichloropropane	1.0	U	1.0	0.25	ug/L			09/08/16 14:01	1
Ethylbenzene	1.0	U	1.0	0.25	ug/L			09/08/16 14:01	1
Iodomethane	1.0	U	1.0	0.42	ug/L			09/08/16 14:01	1
Methylene Chloride	1.0	U	1.0	0.33	ug/L			09/08/16 14:01	1
Styrene	1.0	U	1.0	0.45	ug/L			09/08/16 14:01	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.22	ug/L			09/08/16 14:01	1
Tetrachloroethene	1.0	U	1.0	0.31	ug/L			09/08/16 14:01	1
Toluene	1.0	U	1.0	0.23	ug/L			09/08/16 14:01	1
1,1,1-Trichloroethane	1.0	U	1.0	0.44	ug/L			09/08/16 14:01	1
1,1,2-Trichloroethane	1.0	U	1.0	0.24	ug/L			09/08/16 14:01	1
Trichloroethene	1.0	U	1.0	0.22	ug/L			09/08/16 14:01	1
Vinyl chloride	1.0	U	1.0	0.29	ug/L			09/08/16 14:01	1
Xylenes, Total	2.0	U	2.0	0.52	ug/L			09/08/16 14:01	1
Surrogate	MB %Recovery	MB Qualifier	MB Limits			Prepared	Analyzed	Dil Fac	
4-Bromofluorobenzene (Surr)	89		73 - 120				09/08/16 14:01	1	
Dibromofluoromethane (Surr)	90		80 - 120				09/08/16 14:01	1	
1,2-Dichloroethane-d4 (Surr)	89		63 - 132				09/08/16 14:01	1	
Toluene-d8 (Surr)	91		73 - 124				09/08/16 14:01	1	

**Lab Sample ID: LCS 240-245997/4**

**Matrix: Water**

**Analysis Batch: 245997**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits
Acrylonitrile	100	106		ug/L		106	69 - 125	
Benzene	10.0	10.3		ug/L		103	80 - 120	
Bromoform	10.0	10.7		ug/L		107	52 - 157	
Bromomethane	10.0	17.6 *		ug/L		176	24 - 160	
Carbon disulfide	10.0	12.3		ug/L		123	58 - 160	
Carbon tetrachloride	10.0	11.0		ug/L		110	69 - 149	
Chlorobenzene	10.0	9.72		ug/L		97	80 - 120	
Chloroethane	10.0	17.8 *		ug/L		178	24 - 147	
Chloroform	10.0	10.1		ug/L		101	80 - 120	
Chloromethane	10.0	8.57		ug/L		86	50 - 135	

TestAmerica Canton

## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-245997/4		Client Sample ID: Lab Control Sample Prep Type: Total/NA						
Matrix: Water	Analysis Batch: 245997	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorobromomethane		10.0	10.5		ug/L	105	76 - 125	
1,2-Dichloroethane		10.0	9.13		ug/L	91	76 - 130	
1,1-Dichloroethene		10.0	10.2		ug/L	102	70 - 141	
1,2-Dichloropropane		10.0	11.1		ug/L	111	79 - 121	
Ethylbenzene		10.0	10.1		ug/L	101	80 - 120	
Iodomethane		10.0	10.8		ug/L	108	68 - 150	
Methylene Chloride		10.0	10.6		ug/L	106	68 - 136	
Styrene		10.0	10.6		ug/L	106	80 - 120	
1,1,2,2-Tetrachloroethane		10.0	10.3		ug/L	103	61 - 130	
Tetrachloroethene		10.0	9.35		ug/L	93	80 - 123	
Toluene		10.0	9.92		ug/L	99	80 - 121	
1,1,1-Trichloroethane		10.0	11.4		ug/L	114	79 - 133	
1,1,2-Trichloroethane		10.0	9.78		ug/L	98	80 - 120	
Trichloroethene		10.0	9.54		ug/L	95	80 - 122	
Vinyl chloride		10.0	9.11		ug/L	91	60 - 129	
Xylenes, Total		20.0	19.9		ug/L	99	80 - 120	
<b>Surrogate</b>		<b>LCS %Recovery</b>	<b>LCS Qualifier</b>	<b>Limits</b>				
4-Bromofluorobenzene (Surr)		96		73 - 120				
Dibromofluoromethane (Surr)		92		80 - 120				
1,2-Dichloroethane-d4 (Surr)		83		63 - 132				
Toluene-d8 (Surr)		94		73 - 124				

### Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-245545/19-A  
Matrix: Water  
Analysis Batch: 245724

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 245545

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.20	U	0.20	0.044	ug/L	09/06/16 07:58	09/07/16 13:45		1
Acenaphthylene	0.20	U	0.20	0.020	ug/L	09/06/16 07:58	09/07/16 13:45		1
Anthracene	0.20	U	0.20	0.031	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[a]anthracene	0.20	U	0.20	0.059	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[b]fluoranthene	0.20	U	0.20	0.059	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[k]fluoranthene	0.20	U	0.20	0.048	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[g,h,i]perylene	0.20	U	0.20	0.050	ug/L	09/06/16 07:58	09/07/16 13:45		1
Benzo[a]pyrene	0.20	U	0.20	0.030	ug/L	09/06/16 07:58	09/07/16 13:45		1
Chrysene	0.20	U	0.20	0.035	ug/L	09/06/16 07:58	09/07/16 13:45		1
Dibenz(a,h)anthracene	0.20	U	0.20	0.040	ug/L	09/06/16 07:58	09/07/16 13:45		1
Fluoranthene	0.20	U	0.20	0.027	ug/L	09/06/16 07:58	09/07/16 13:45		1
Fluorene	0.20	U	0.20	0.034	ug/L	09/06/16 07:58	09/07/16 13:45		1
Indeno[1,2,3-cd]pyrene	0.20	U	0.20	0.048	ug/L	09/06/16 07:58	09/07/16 13:45		1
Naphthalene	0.20	U	0.20	0.043	ug/L	09/06/16 07:58	09/07/16 13:45		1
Phenanthrene	0.20	U	0.20	0.031	ug/L	09/06/16 07:58	09/07/16 13:45		1
Pyrene	0.20	U	0.20	0.028	ug/L	09/06/16 07:58	09/07/16 13:45		1

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## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

**Lab Sample ID: MB 240-245545/19-A**

**Matrix: Water**

**Analysis Batch: 245724**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 245545**

Tentatively Identified Compound	MB MB		Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
	Est. Result	Qualifier							
Perylene TIC	10	U	ug/L			198-55-0	09/06/16 07:58	09/07/16 13:45	1
<b>Surrogate</b>									
2-Fluorobiphenyl (Surr)	67		44 - 120				09/06/16 07:58	09/07/16 13:45	1
2-Fluorophenol (Surr)	52		26 - 120				09/06/16 07:58	09/07/16 13:45	1
2,4,6-Tribromophenol (Surr)	62		36 - 120				09/06/16 07:58	09/07/16 13:45	1
Nitrobenzene-d5 (Surr)	62		44 - 120				09/06/16 07:58	09/07/16 13:45	1
Phenol-d5 (Surr)	29		16 - 120				09/06/16 07:58	09/07/16 13:45	1
Terphenyl-d14 (Surr)	76		43 - 120				09/06/16 07:58	09/07/16 13:45	1

**Lab Sample ID: LCS 240-245545/20-A**

**Matrix: Water**

**Analysis Batch: 245724**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 245545**

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Acenaphthene	32.0	25.2		ug/L		79	58 - 120
Acenaphthylene	32.0	24.6		ug/L		77	59 - 120
Anthracene	32.0	24.8		ug/L		77	58 - 120
Benzo[a]anthracene	32.0	24.5		ug/L		77	58 - 120
Benzo[b]fluoranthene	32.0	26.9		ug/L		84	59 - 120
Benzo[k]fluoranthene	32.0	26.8		ug/L		84	61 - 120
Benzo[g,h,i]perylene	32.0	28.0		ug/L		88	41 - 127
Benzo[a]pyrene	32.0	27.8		ug/L		87	63 - 120
Chrysene	32.0	24.6		ug/L		77	59 - 120
Dibenz(a,h)anthracene	32.0	28.4		ug/L		89	39 - 125
Fluoranthene	32.0	25.1		ug/L		78	59 - 120
Fluorene	32.0	25.5		ug/L		80	57 - 120
Indeno[1,2,3-cd]pyrene	32.0	28.0		ug/L		88	49 - 121
Naphthalene	32.0	25.1		ug/L		78	58 - 120
Phenanthrene	32.0	24.6		ug/L		77	57 - 120
Pyrene	32.0	24.6		ug/L		77	57 - 120
<b>Surrogate</b>							
2-Fluorobiphenyl (Surr)	79		44 - 120				
2-Fluorophenol (Surr)	65		26 - 120				
2,4,6-Tribromophenol (Surr)	85		36 - 120				
Nitrobenzene-d5 (Surr)	87		44 - 120				
Phenol-d5 (Surr)	41		16 - 120				
Terphenyl-d14 (Surr)	89		43 - 120				

TestAmerica Canton

# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

## Method: 610 - PAHs (HPLC)

**Lab Sample ID: MB 490-367795/1-A**

**Matrix: Water**

**Analysis Batch: 368151**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 367795**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	1.0	U	1.0	0.17	ug/L	09/04/16 18:43	09/07/16 07:15		1
Acenaphthylene	1.0	U	1.0	0.23	ug/L	09/04/16 18:43	09/07/16 07:15		1
Anthracene	1.0	U	1.0	0.10	ug/L	09/04/16 18:43	09/07/16 07:15		1
Benzo[a]anthracene	0.20	U	0.20	0.020	ug/L	09/04/16 18:43	09/07/16 07:15		1
Benzo[b]fluoranthene	0.10	U	0.10	0.020	ug/L	09/04/16 18:43	09/07/16 07:15		1
Benzo[k]fluoranthene	0.14	U	0.14	0.020	ug/L	09/04/16 18:43	09/07/16 07:15		1
Benzo[g,h,i]perylene	0.20	U	0.20	0.020	ug/L	09/04/16 18:43	09/07/16 07:15		1
Benzo[a]pyrene	0.10	U	0.10	0.020	ug/L	09/04/16 18:43	09/07/16 07:15		1
Chrysene	0.10	U	0.10	0.020	ug/L	09/04/16 18:43	09/07/16 07:15		1
Dibenz(a,h)anthracene	0.20	U	0.20	0.030	ug/L	09/04/16 18:43	09/07/16 07:15		1
Fluoranthene	0.20	U	0.20	0.030	ug/L	09/04/16 18:43	09/07/16 07:15		1
Fluorene	0.50	U	0.50	0.040	ug/L	09/04/16 18:43	09/07/16 07:15		1
Indeno[1,2,3-cd]pyrene	0.20	U	0.20	0.040	ug/L	09/04/16 18:43	09/07/16 07:15		1
Naphthalene	1.0	U	1.0	0.34	ug/L	09/04/16 18:43	09/07/16 07:15		1
Phenanthrene	0.50	U	0.50	0.050	ug/L	09/04/16 18:43	09/07/16 07:15		1
Pyrene	0.20	U	0.20	0.030	ug/L	09/04/16 18:43	09/07/16 07:15		1
<hr/>									
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
p-Terphenyl	69		52 - 135				09/04/16 18:43	09/07/16 07:15	1

**Lab Sample ID: LCS 490-367795/2-A**

**Matrix: Water**

**Analysis Batch: 368151**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 367795**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Acenaphthene	2.50	2.21		ug/L	88	10 - 124	
Acenaphthene	2.50	2.20		ug/L	88	10 - 124	
Acenaphthylene	7.50	5.87		ug/L	78	10 - 139	
Anthracene	2.50	2.51		ug/L	100	10 - 126	
Benzo[a]anthracene	2.50	2.40		ug/L	96	12 - 135	
Benzo[b]fluoranthene	2.50	2.39		ug/L	96	10 - 150	
Benzo[k]fluoranthene	2.50	2.38		ug/L	95	10 - 159	
Benzo[g,h,i]perylene	2.50	1.97		ug/L	79	10 - 116	
Benzo[a]pyrene	2.50	2.55		ug/L	102	10 - 128	
Chrysene	2.50	2.49		ug/L	100	10 - 199	
Dibenz(a,h)anthracene	2.50	1.26		ug/L	51	10 - 110	
Fluoranthene	2.50	2.31		ug/L	93	14 - 123	
Fluorene	2.50	2.16		ug/L	86	10 - 142	
Indeno[1,2,3-cd]pyrene	2.50	2.40		ug/L	96	10 - 116	
Naphthalene	2.50	2.02		ug/L	81	10 - 122	
Phenanthrene	2.50	2.22		ug/L	89	10 - 155	
Pyrene	2.50	2.20		ug/L	88	10 - 140	
<hr/>							
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
p-Terphenyl	88		52 - 135				

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# QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

## Method: 8315A - Carbonyl Compounds by HPLC

**Lab Sample ID: MB 240-245441/4-A**

**Matrix: Water**

**Analysis Batch: 245490**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Formaldehyde	0.050	U	0.050	0.010	mg/L		09/03/16 08:35	09/05/16 14:38	1

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 245441**

**Lab Sample ID: LCS 240-245441/5-A**

**Matrix: Water**

**Analysis Batch: 245490**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Formaldehyde	0.200	0.167		mg/L		84	30 - 142

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 245441**

**%Rec.**

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 240-245616/1-A**

**Matrix: Water**

**Analysis Batch: 246090**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	10	U	10	3.3	ug/L		09/06/16 14:00	09/08/16 17:26	1
Beryllium	5.0	U	5.0	0.21	ug/L		09/06/16 14:00	09/08/16 17:26	1
Cadmium	2.0	U	2.0	0.29	ug/L		09/06/16 14:00	09/08/16 17:26	1
Chromium	5.0	U	5.0	0.55	ug/L		09/06/16 14:00	09/08/16 17:26	1
Cobalt	7.0	U	7.0	0.84	ug/L		09/06/16 14:00	09/08/16 17:26	1
Lead	5.0	U	5.0	1.9	ug/L		09/06/16 14:00	09/08/16 17:26	1
Manganese	15	U	15	5.1	ug/L		09/06/16 14:00	09/08/16 17:26	1
Nickel	40	U	40	1.6	ug/L		09/06/16 14:00	09/08/16 17:26	1
Selenium	15	U	15	5.1	ug/L		09/06/16 14:00	09/08/16 17:26	1

**Client Sample ID: Method Blank**

**Prep Type: Total Recoverable**

**Prep Batch: 245616**

**Lab Sample ID: LCS 240-245616/2-A**

**Matrix: Water**

**Analysis Batch: 246090**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	2000	2170		ug/L		109	85 - 115
Beryllium	50.0	50.1		ug/L		100	85 - 115
Cadmium	50.0	54.7		ug/L		109	85 - 115
Chromium	200	201		ug/L		101	85 - 115
Cobalt	500	510		ug/L		102	85 - 115
Lead	500	500		ug/L		100	85 - 115
Manganese	500	513		ug/L		103	85 - 115
Nickel	500	513		ug/L		103	85 - 115
Selenium	2000	2220		ug/L		111	85 - 115

**Client Sample ID: Lab Control Sample**

**Prep Type: Total Recoverable**

**Prep Batch: 245616**

**%Rec.**

**Lab Sample ID: 240-69014-1 MS**

**Matrix: Water**

**Analysis Batch: 245804**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	54		2000	2000		ug/L		97	75 - 125
Beryllium	0.37	J	50.0	45.7		ug/L		91	75 - 125
Cadmium	2.0	U	50.0	45.3		ug/L		91	75 - 125

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Prep Type: Total Recoverable**

**Prep Batch: 245616**

**%Rec.**

**Limits**

## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: 240-69014-1 MS**

**Matrix: Water**

**Analysis Batch: 245804**

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Prep Type: Total Recoverable**

**Prep Batch: 245616**

**%Rec.**

**Limits**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Chromium	2.9	J	200	187		ug/L	92	75 - 125	
Cobalt	1.4	J	500	455		ug/L	91	75 - 125	
Lead	5.0	U	500	438		ug/L	88	75 - 125	
Manganese	49		500	512		ug/L	93	75 - 125	
Nickel	7.5	J	500	469		ug/L	92	75 - 125	
Selenium	6.1	J	2000	1940		ug/L	97	75 - 125	

**Lab Sample ID: 240-69014-1 MSD**

**Matrix: Water**

**Analysis Batch: 245804**

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Prep Type: Total Recoverable**

**Prep Batch: 245616**

**%Rec.**

**RPD**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	54		2000	2060		ug/L	100	75 - 125	3	20	
Beryllium	0.37	J	50.0	47.2		ug/L	94	75 - 125	3	20	
Cadmium	2.0	U	50.0	46.7		ug/L	93	75 - 125	3	20	
Chromium	2.9	J	200	190		ug/L	94	75 - 125	2	20	
Cobalt	1.4	J	500	469		ug/L	94	75 - 125	3	20	
Lead	5.0	U	500	453		ug/L	91	75 - 125	3	20	
Manganese	49		500	519		ug/L	94	75 - 125	1	20	
Nickel	7.5	J	500	482		ug/L	95	75 - 125	3	20	
Selenium	6.1	J	2000	2000		ug/L	99	75 - 125	3	20	

**Lab Sample ID: MB 240-246007/1-A**

**Matrix: Water**

**Analysis Batch: 246150**

**Client Sample ID: Method Blank**

**Prep Type: Total Recoverable**

**Prep Batch: 246007**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	10	U	10	3.1	ug/L	09/08/16 14:00	09/09/16 09:54		1
Arsenic	10	U	10	3.3	ug/L	09/08/16 14:00	09/09/16 09:54		1
Beryllium	0.382	J	5.0	0.21	ug/L	09/08/16 14:00	09/09/16 09:54		1
Cadmium	2.0	U	2.0	0.29	ug/L	09/08/16 14:00	09/09/16 09:54		1
Chromium	5.0	U	5.0	0.55	ug/L	09/08/16 14:00	09/09/16 09:54		1
Cobalt	7.0	U	7.0	0.84	ug/L	09/08/16 14:00	09/09/16 09:54		1
Lead	5.0	U	5.0	1.9	ug/L	09/08/16 14:00	09/09/16 09:54		1
Manganese	15	U	15	5.1	ug/L	09/08/16 14:00	09/09/16 09:54		1
Nickel	40	U	40	1.6	ug/L	09/08/16 14:00	09/09/16 09:54		1
Selenium	15	U	15	5.1	ug/L	09/08/16 14:00	09/09/16 09:54		1

**Lab Sample ID: LCS 240-246007/2-A**

**Matrix: Water**

**Analysis Batch: 246150**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total Recoverable**

**Prep Batch: 246007**

**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	500	519		ug/L	104	85 - 115	
Arsenic	2000	2240		ug/L	112	85 - 115	
Beryllium	50.0	53.6		ug/L	107	85 - 115	
Cadmium	50.0	55.2		ug/L	110	85 - 115	
Chromium	200	207		ug/L	103	85 - 115	
Cobalt	500	524		ug/L	105	85 - 115	

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## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

**Lab Sample ID: LCS 240-246007/2-A**

**Matrix: Water**

**Analysis Batch: 246150**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total Recoverable**

**Prep Batch: 246007**

**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lead	500	531		ug/L		106	85 - 115
Manganese	500	528		ug/L		106	85 - 115
Nickel	500	538		ug/L		108	85 - 115
Selenium	2000	2260		ug/L		113	85 - 115

### Method: 245.1 - Mercury (CVAA)

**Lab Sample ID: MB 240-245621/1-A**

**Matrix: Water**

**Analysis Batch: 245820**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

**Prep Batch: 245621**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.20	U	0.20	0.090	ug/L		09/06/16 14:00	09/07/16 10:40	1

**Lab Sample ID: LCS 240-245621/2-A**

**Matrix: Water**

**Analysis Batch: 245820**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 245621**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	5.00	5.11		ug/L		102	85 - 115

**Lab Sample ID: 240-69014-1 MS**

**Matrix: Water**

**Analysis Batch: 245820**

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Prep Type: Total/NA**

**Prep Batch: 245621**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	0.20	U	1.00	0.943		ug/L		94	70 - 130

**Lab Sample ID: 240-69014-1 MSD**

**Matrix: Water**

**Analysis Batch: 245820**

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Prep Type: Total/NA**

**Prep Batch: 245621**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	RPD	Limits	
Mercury	0.20	U	1.00	0.983		ug/L		98	70 - 130	4	20

### Method: 4500 S2 F-2000 - Sulfide, Total

**Lab Sample ID: MB 240-245602/1**

**Matrix: Water**

**Analysis Batch: 245602**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	1.0	U	1.0	0.41	mg/L			09/06/16 11:16	1
Sulfide as H <sub>2</sub> S	1.0	U	1.0	0.41	mg/L			09/06/16 11:16	1

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## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Method: 4500 S2 F-2000 - Sulfide, Total (Continued)

**Lab Sample ID:** LCS 240-245602/2

**Matrix:** Water

**Analysis Batch:** 245602

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Sulfide	23.7	23.6		mg/L	100	79 - 110	

### Method: 9012B - Cyanide, Total andor Amenable

**Lab Sample ID:** MB 240-245668/1-A

**Matrix:** Water

**Analysis Batch:** 245689

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

**Prep Batch:** 245668

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.010	U	0.010	0.0050	mg/L		09/06/16 14:27	09/06/16 16:05	1

**Lab Sample ID:** LCS 240-245668/2-A

**Matrix:** Water

**Analysis Batch:** 245689

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

**Prep Batch:** 245668

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Cyanide, Total	0.0400	0.0328		mg/L	82	69 - 118	

### Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID:** MB 240-245678/3

**Matrix:** Water

**Analysis Batch:** 245678

**Client Sample ID:** Method Blank

**Prep Type:** Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.0	U	1.0	0.41	mg/L		09/07/16 00:22		1
Fluoride	1.0	U	1.0	0.0090	mg/L		09/07/16 00:22		1
Sulfate	1.0	U	1.0	0.13	mg/L		09/07/16 00:22		1

**Lab Sample ID:** LCS 240-245678/4

**Matrix:** Water

**Analysis Batch:** 245678

**Client Sample ID:** Lab Control Sample

**Prep Type:** Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
Chloride	50.0	53.4		mg/L	107	90 - 110	
Fluoride	2.50	2.69		mg/L	108	90 - 110	
Sulfate	50.0	52.1		mg/L	104	90 - 110	

**Lab Sample ID:** 240-69014-1 MS

**Matrix:** Water

**Analysis Batch:** 245678

**Client Sample ID:** DAY 2 Q1 (QUENCH 1 AND 2)

**Prep Type:** Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec.
Fluoride	0.87	J	2.50	3.48		mg/L	104	80 - 120	

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## QC Sample Results

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### **Method: 9056A - Anions, Ion Chromatography (Continued)**

**Lab Sample ID: 240-69014-1 MSD**

**Matrix: Water**

**Analysis Batch: 245678**

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Prep Type: Total/NA**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec.	%Rec.	RPD	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier							
Fluoride	0.87	J	2.50	3.41		mg/L	102	80 - 120		2		15

### **Method: SM 2540C - Solids, Total Dissolved (TDS)**

**Lab Sample ID: MB 240-245681/1**

**Matrix: Water**

**Analysis Batch: 245681**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total Dissolved Solids	10	U	10	7.4	mg/L			09/06/16 15:10	1

**Lab Sample ID: LCS 240-245681/2**

**Matrix: Water**

**Analysis Batch: 245681**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike	LCS	LCS	Unit	D	%Rec.	%Rec.
	Added	Result	Qualifier				
Total Dissolved Solids	216	238		mg/L	110	88 - 110	

## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### GC/MS VOA

#### Analysis Batch: 245997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	8260B	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	8260B	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	8260B	
MB 240-245997/6	Method Blank	Total/NA	Water	8260B	
LCS 240-245997/4	Lab Control Sample	Total/NA	Water	8260B	

### GC/MS Semi VOA

#### Prep Batch: 245545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	3510C	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	3510C	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	3510C	
MB 240-245545/19-A	Method Blank	Total/NA	Water	3510C	
LCS 240-245545/20-A	Lab Control Sample	Total/NA	Water	3510C	

#### Analysis Batch: 245724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-245545/19-A	Method Blank	Total/NA	Water	8270C	245545
LCS 240-245545/20-A	Lab Control Sample	Total/NA	Water	8270C	245545

#### Analysis Batch: 245901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	8270C	245545
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	8270C	245545
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	8270C	245545

### HPLC/IC

#### Prep Batch: 245441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	8315A_W_Prep	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	8315A_W_Prep	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	8315A_W_Prep	
MB 240-245441/4-A	Method Blank	Total/NA	Water	8315A_W_Prep	
LCS 240-245441/5-A	Lab Control Sample	Total/NA	Water	8315A_W_Prep	

#### Analysis Batch: 245490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	8315A	245441
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	8315A	245441
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	8315A	245441
MB 240-245441/4-A	Method Blank	Total/NA	Water	8315A	245441
LCS 240-245441/5-A	Lab Control Sample	Total/NA	Water	8315A	245441

#### Prep Batch: 367795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	610	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	610	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	610	

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## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### HPLC/IC (Continued)

#### Prep Batch: 367795 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 490-367795/1-A	Method Blank	Total/NA	Water	610	
LCS 490-367795/2-A	Lab Control Sample	Total/NA	Water	610	

#### Analysis Batch: 367795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	610	367795
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	610	367795
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	610	367795
MB 490-367795/1-A	Method Blank	Total/NA	Water	610	367795
LCS 490-367795/2-A	Lab Control Sample	Total/NA	Water	610	367795

### Metals

#### Prep Batch: 245616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total Recoverable	Water	200.7	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total Recoverable	Water	200.7	
MB 240-245616/1-A	Method Blank	Total Recoverable	Water	200.7	
LCS 240-245616/2-A	Lab Control Sample	Total Recoverable	Water	200.7	
240-69014-1 MS	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7	
240-69014-1 MSD	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7	

#### Prep Batch: 245621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	245.1	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	245.1	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	245.1	
MB 240-245621/1-A	Method Blank	Total/NA	Water	245.1	
LCS 240-245621/2-A	Lab Control Sample	Total/NA	Water	245.1	
240-69014-1 MS	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	245.1	
240-69014-1 MSD	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	245.1	

#### Analysis Batch: 245804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69014-1 MS	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7 Rev 4.4	245616
240-69014-1 MSD	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7 Rev 4.4	245616

#### Analysis Batch: 245820

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	245.1	245621
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	245.1	245621
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	245.1	245621
MB 240-245621/1-A	Method Blank	Total/NA	Water	245.1	245621
LCS 240-245621/2-A	Lab Control Sample	Total/NA	Water	245.1	245621
240-69014-1 MS	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	245.1	245621
240-69014-1 MSD	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	245.1	245621

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## QC Association Summary

Client: Environmental Quality Mgt., Inc.  
Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Metals (Continued)

#### Prep Batch: 246007

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total Recoverable	Water	200.7	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total Recoverable	Water	200.7	
MB 240-246007/1-A	Method Blank	Total Recoverable	Water	200.7	
LCS 240-246007/2-A	Lab Control Sample	Total Recoverable	Water	200.7	

#### Analysis Batch: 246090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-245616/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	245616
LCS 240-245616/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	245616

#### Analysis Batch: 246150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total Recoverable	Water	200.7 Rev 4.4	246007
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total Recoverable	Water	200.7 Rev 4.4	246007
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total Recoverable	Water	200.7 Rev 4.4	246007
MB 240-246007/1-A	Method Blank	Total Recoverable	Water	200.7 Rev 4.4	246007
LCS 240-246007/2-A	Lab Control Sample	Total Recoverable	Water	200.7 Rev 4.4	246007

### General Chemistry

#### Analysis Batch: 245602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	4500 S2 F-2000	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	4500 S2 F-2000	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	4500 S2 F-2000	
MB 240-245602/1	Method Blank	Total/NA	Water	4500 S2 F-2000	
LCS 240-245602/2	Lab Control Sample	Total/NA	Water	4500 S2 F-2000	

#### Prep Batch: 245668

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	9012B	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	9012B	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	9012B	
MB 240-245668/1-A	Method Blank	Total/NA	Water	9012B	
LCS 240-245668/2-A	Lab Control Sample	Total/NA	Water	9012B	

#### Analysis Batch: 245678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	9056A	
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	9056A	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	9056A	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	9056A	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	9056A	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	9056A	
MB 240-245678/3	Method Blank	Total/NA	Water	9056A	
LCS 240-245678/4	Lab Control Sample	Total/NA	Water	9056A	
240-69014-1 MS	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	9056A	
240-69014-1 MSD	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	9056A	

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## QC Association Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### General Chemistry (Continued)

#### Analysis Batch: 245681

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	SM 2540C	
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	SM 2540C	
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	SM 2540C	
MB 240-245681/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 240-245681/2	Lab Control Sample	Total/NA	Water	SM 2540C	

#### Analysis Batch: 245689

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-69014-1	DAY 2 Q1 (QUENCH 1 AND 2)	Total/NA	Water	9012B	245668
240-69014-2	DAY 2 Q2 (QUENCH 10)	Total/NA	Water	9012B	245668
240-69014-3	DAY 2 Q3 (QUENCH 20)	Total/NA	Water	9012B	245668
MB 240-245668/1-A	Method Blank	Total/NA	Water	9012B	245668
LCS 240-245668/2-A	Lab Control Sample	Total/NA	Water	9012B	245668

## Lab Chronicle

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**

**Lab Sample ID: 240-69014-1**

Date Collected: 08/31/16 10:30

Matrix: Water

Date Received: 09/02/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	245997	09/08/16 18:02	LRW	TAL CAN
Total/NA	Prep	3510C			245545	09/06/16 07:58	CS	TAL CAN
Total/NA	Analysis	8270C		1	245901	09/08/16 10:18	TMH	TAL CAN
Total/NA	Prep	610			367795	09/04/16 18:43	DHC	TAL NSH
Total/NA	Analysis	610		1	368151	09/07/16 09:16	ET	TAL NSH
Total/NA	Prep	8315A_W_Prep			245441	09/03/16 08:35	CS	TAL CAN
Total/NA	Analysis	8315A		1	245490	09/05/16 14:13	KMG	TAL CAN
Total Recoverable	Prep	200.7			246007	09/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246150	09/09/16 14:29	RKT	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	245804	09/07/16 23:41	RKT	TAL CAN
Total/NA	Prep	245.1			245621	09/06/16 14:00	AJC	TAL CAN
Total/NA	Analysis	245.1		1	245820	09/07/16 10:58	DSH	TAL CAN
Total/NA	Analysis	4500 S2 F-2000		1	245602	09/06/16 13:09	BLW	TAL CAN
Total/NA	Prep	9012B			245668	09/06/16 14:27	JWW	TAL CAN
Total/NA	Analysis	9012B		1	245689	09/06/16 16:05	JWW	TAL CAN
Total/NA	Analysis	9056A			245678	09/07/16 04:24	LCN	TAL CAN
Total/NA	Analysis	9056A		5	245678	09/07/16 05:25	LCN	TAL CAN
Total/NA	Analysis	SM 2540C		1	245681	09/06/16 15:10	JW	TAL CAN

**Client Sample ID: DAY 2 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69014-2**

Date Collected: 08/31/16 13:03

Matrix: Water

Date Received: 09/02/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	245997	09/08/16 18:24	LRW	TAL CAN
Total/NA	Prep	3510C			245545	09/06/16 07:58	CS	TAL CAN
Total/NA	Analysis	8270C		1	245901	09/08/16 09:53	TMH	TAL CAN
Total/NA	Prep	610			367795	09/04/16 18:43	DHC	TAL NSH
Total/NA	Analysis	610		1	368151	09/07/16 09:40	ET	TAL NSH
Total/NA	Prep	8315A_W_Prep			245441	09/03/16 08:35	CS	TAL CAN
Total/NA	Analysis	8315A		1	245490	09/05/16 14:22	KMG	TAL CAN
Total Recoverable	Prep	200.7			246007	09/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246150	09/09/16 14:33	RKT	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	245804	09/07/16 23:53	RKT	TAL CAN
Total/NA	Prep	245.1			245621	09/06/16 14:00	AJC	TAL CAN
Total/NA	Analysis	245.1		1	245820	09/07/16 11:05	DSH	TAL CAN
Total/NA	Analysis	4500 S2 F-2000		1	245602	09/06/16 13:19	BLW	TAL CAN
Total/NA	Prep	9012B			245668	09/06/16 14:27	JWW	TAL CAN
Total/NA	Analysis	9012B		1	245689	09/06/16 16:05	JWW	TAL CAN
Total/NA	Analysis	9056A		1	245678	09/07/16 05:45	LCN	TAL CAN

TestAmerica Canton

## Lab Chronicle

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

**Client Sample ID: DAY 2 Q2 (QUENCH 10)**

**Lab Sample ID: 240-69014-2**

Date Collected: 08/31/16 13:03

Matrix: Water

Date Received: 09/02/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	245678	09/07/16 06:05	LCN	TAL CAN
Total/NA	Analysis	SM 2540C		1	245681	09/06/16 15:10	JW	TAL CAN

**Client Sample ID: DAY 2 Q3 (QUENCH 20)**

**Lab Sample ID: 240-69014-3**

Date Collected: 08/31/16 16:21

Matrix: Water

Date Received: 09/02/16 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	245997	09/08/16 18:46	LRW	TAL CAN
Total/NA	Prep	3510C			245545	09/06/16 07:58	CS	TAL CAN
Total/NA	Analysis	8270C		1	245901	09/08/16 09:28	TMH	TAL CAN
Total/NA	Prep	610			367795	09/04/16 18:43	DHC	TAL NSH
Total/NA	Analysis	610		1	368151	09/07/16 10:05	ET	TAL NSH
Total/NA	Prep	8315A_W_Prep			245441	09/03/16 08:35	CS	TAL CAN
Total/NA	Analysis	8315A		1	245490	09/05/16 14:30	KMG	TAL CAN
Total Recoverable	Prep	200.7			246007	09/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	246150	09/09/16 14:37	RKT	TAL CAN
Total Recoverable	Prep	200.7			245616	09/06/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	200.7 Rev 4.4		1	245804	09/07/16 23:57	RKT	TAL CAN
Total/NA	Prep	245.1			245621	09/06/16 14:00	AJC	TAL CAN
Total/NA	Analysis	245.1		1	245820	09/07/16 11:07	DSH	TAL CAN
Total/NA	Analysis	4500 S2 F-2000		1	245602	09/06/16 13:28	BLW	TAL CAN
Total/NA	Prep	9012B			245668	09/06/16 14:27	JWW	TAL CAN
Total/NA	Analysis	9012B		1	245689	09/06/16 16:05	JWW	TAL CAN
Total/NA	Analysis	9056A			245678	09/07/16 06:25	LCN	TAL CAN
Total/NA	Analysis	9056A		5	245678	09/07/16 06:45	LCN	TAL CAN
Total/NA	Analysis	SM 2540C		1	245681	09/06/16 15:10	JW	TAL CAN

### Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

## Certification Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Laboratory: TestAmerica Canton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17
Illinois	NELAP	5	200004	07-31-17
Kansas	NELAP	7	E-10336	01-31-17
Kentucky (UST)	State Program	4	58	02-23-17
Kentucky (WW)	State Program	4	98016	12-31-16 *
Minnesota	NELAP	5	039-999-348	12-31-16 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17
Nevada	State Program	9	OH-000482008A	07-31-17
New Jersey	NELAP	2	OH001	06-30-17
New York	NELAP	2	10975	03-31-17
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-17
Pennsylvania	NELAP	3	68-00340	08-31-17
Texas	NELAP	6	T104704517-15-5	08-31-17
USDA	Federal		P330-13-00319	11-26-16 *
Virginia	NELAP	3	460175	09-14-16 *
Washington	State Program	10	C971	01-12-17
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17

### Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-17
A2LA	ISO/IEC 17025		0453.07	12-31-17
Alaska (UST)	State Program	10	UST-087	07-24-17
Arizona	State Program	9	AZ0473	05-05-17
Arkansas DEQ	State Program	6	88-0737	04-25-17
California	State Program	9	2938	10-31-16
Connecticut	State Program	1	PH-0220	12-31-17
Florida	NELAP	4	E87358	06-30-17
Georgia	State Program	4	N/A	12-31-17
Illinois	NELAP	5	200010	12-09-16 *
Iowa	State Program	7	131	04-01-18
Kansas	NELAP	7	E-10229	10-31-16 *
Kentucky (UST)	State Program	4	19	06-30-17
Kentucky (WW)	State Program	4	90038	12-31-16
Louisiana	NELAP	6	30613	06-30-17
Maine	State Program	1	TN00032	11-03-17
Maryland	State Program	3	316	03-31-17
Massachusetts	State Program	1	M-TN032	06-30-17
Minnesota	NELAP	5	047-999-345	12-31-16 *
Mississippi	State Program	4	N/A	06-30-16 *
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-17
New Hampshire	NELAP	1	2963	10-09-16 *

\* Certification renewal pending - certification considered valid.

TestAmerica Canton

## Certification Summary

Client: Environmental Quality Mgt., Inc.

Project/Site: AK Steel-Stack Testing Quench Towers

TestAmerica Job ID: 240-69014-1

### Laboratory: TestAmerica Nashville (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
New Jersey	NELAP	2	TN965	06-30-17
New York	NELAP	2	11342	03-31-17
North Carolina (WW/SW)	State Program	4	387	12-31-16
North Dakota	State Program	8	R-146	06-30-17
Ohio VAP	State Program	5	CL0033	07-10-17
Oklahoma	State Program	6	9412	08-31-17
Oregon	NELAP	10	TN200001	04-27-17
Pennsylvania	NELAP	3	68-00585	06-30-17
Rhode Island	State Program	1	LAO00268	12-30-16
South Carolina	State Program	4	84009 (001)	02-18-17
South Carolina (Do Not Use - DW)	State Program	4	84009 (002)	12-16-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-17
USDA	Federal		P330-13-00306	10-30-16
Utah	NELAP	8	TN00032	07-31-17
Virginia	NELAP	3	460152	06-14-17
Washington	State Program	10	C789	07-19-17
West Virginia DEP	State Program	3	219	02-28-17
Wisconsin	State Program	5	998020430	08-31-17
Wyoming (UST)	A2LA	8	453.07	12-31-17



TestAmerica Canton

<b>H6I060404 Analytical Report .....</b>	<b>1</b>
<b>Sample Receipt Documentation .....</b>	<b>19</b>



THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

## ANALYTICAL REPORT

PROJECT NO. 240-69014-1

AK Steel-Stack Quench Towers

Lot #: H6I060404

Opal Johnson

TestAmerica Canton  
4101 Shuffel Street NW  
North Canton, OH 44720

TESTAMERICA LABORATORIES, INC.

*Ryan Henry*  
Ryan Henry  
Project Manager

September 22, 2016

## ANALYTICAL METHODS SUMMARY

H6I060404

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Dioxins/Furans, HRGC/HRMS	EPA-5 1613B

### References:

EPA-5 "Method 1613: Tetra- through Octa- Chlorinated Dioxins and Furans by Isotope Dilution, HRGC/HRMS, Revision B", EPA, OCTOBER 1994

## SAMPLE SUMMARY

H6I060404

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED DATE</u>	<u>SAMP TIME</u>
M868X	001	DAY 2 Q1 (QUENCH 1 AND 2)	08/31/16	10:30
M8680	002	DAY 2 Q2 (QUENCH 10)	08/31/16	13:03
M8681	003	DAY 2 Q3 (QUENCH 20)	08/31/16	16:21

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight-basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

## PROJECT NARRATIVE H6I060404

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

### Sample Receipt

There were no problems with the condition of the samples received.

### Quality Control and Data Interpretation

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level:** The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

## PROJECT NARRATIVE H6I060404

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of  $\geq 2.5$  to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits ( $\pm 15\%$  of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within  $\pm 3$  seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

## PROJECT NARRATIVE

### H6I060404

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.<sup>1,2,3</sup> The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Q_{is}}{His \times RRF \times W \times S}$$

Where:

- N = peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute
- His = peak height of quantitation ion for appropriate internal standard
- Q<sub>is</sub> = ng of internal standard added to sample
- RRF = mean relative response factor of compound obtained during initial calibration
- W = amount of sample extracted (grams or liters)
- S = percent solids (optional, if results are requested to be reported on dry weight basis)

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Q_{is}}{Ais \times RRF \times W \times S}$$

Where:

- As = Sum of areas of the target peaks
- Q<sub>is</sub> = ng of internal standard added to sample
- A<sub>is</sub> = Sum of areas of the internal standard peaks
- RRF = mean relative response factor of compound obtained during initial calibration

## PROJECT NARRATIVE H6I060404

W = amount of sample extracted (grams or liters)  
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of  $\geq 2.5$  times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenz-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenz-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

## CERTIFICATION SUMMARY

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Knoxville	L-A-B	DoD ELAP		L2311
TestAmerica Knoxville	Arkansas DEQ	State Program	6	88-0688
TestAmerica Knoxville	California	State Program	9	2423
TestAmerica Knoxville	Colorado	State Program	8	N/A
TestAmerica Knoxville	Connecticut	State Program	1	PH-0223
TestAmerica Knoxville	Florida	NELAC	4	E87177
TestAmerica Knoxville	Georgia	State Program	4	906
TestAmerica Knoxville	Hawaii	State Program	9	N/A
TestAmerica Knoxville	Kansas	NELAC	7	E-10349
TestAmerica Knoxville	Kentucky	State Program	4	90101
TestAmerica Knoxville	Louisiana DOHH	State Program	6	LA150004
TestAmerica Knoxville	Louisiana DEQ	NELAC	6	83979
TestAmerica Knoxville	Maryland	State Program	3	277
TestAmerica Knoxville	Michigan	State Program	5	9933
TestAmerica Knoxville	Nevada	State Program	9	TN00009
TestAmerica Knoxville	New Jersey	NELAC	2	TN001
TestAmerica Knoxville	New York	NELAC	2	10781
TestAmerica Knoxville	North Carolina DENR	State Program	4	64
TestAmerica Knoxville	North Carolina DHHS	State Program	4	21705
TestAmerica Knoxville	Ohio	OVAP	5	CL0059
TestAmerica Knoxville	Oklahoma	State Program	6	9415
TestAmerica Knoxville	Pennsylvania	NELAC	3	68-00576
TestAmerica Knoxville	South Carolina	State Program	4	84001
TestAmerica Knoxville	Tennessee	State Program	4	TN02014
TestAmerica Knoxville	Texas	NELAC	6	T104704380-14-7
TestAmerica Knoxville	Federal	USDA		P330-11-00260
TestAmerica Knoxville	Utah	NELAC	8	TN000092014-5
TestAmerica Knoxville	Virginia	NELAC	3	460176
TestAmerica Knoxville	Virginia	State Program	3	00165
TestAmerica Knoxville	Washington	State Program	10	C593
TestAmerica Knoxville	West Virginia DEP	State Program	3	345
TestAmerica Knoxville	West Virginia DHHR	State Program	3	9955C
TestAmerica Knoxville	Wisconsin	State Program	5	998044300

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

**TestAmerica Canton**  
**Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I060404 - 001	Work Order #....:	M868X1AA	Matrix....:	WATER
Date Sampled....:	08/31/16	Date Received....:	09/03/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1050 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

PARAMETER	RESULT	MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND	9.5	0.13	pg/L
1,2,3,7,8-PeCDD	ND	48	0.11	pg/L
1,2,3,4,7,8-HxCDD	ND	48	0.20	pg/L
1,2,3,6,7,8-HxCDD	ND	48	0.21	pg/L
1,2,3,7,8,9-HxCDD	ND	48	0.20	pg/L
1,2,3,4,6,7,8-HpCDD	0.92	Q B J	0.19	pg/L
OCDD	3.4	Q B J	0.15	pg/L
2,3,7,8-TCDF	0.065	Q J	0.15	pg/L
1,2,3,7,8-PeCDF	ND	48	0.16	pg/L
2,3,4,7,8-PeCDF	ND	48	0.15	pg/L
1,2,3,4,7,8-HxCDF	ND	48	0.13	pg/L
1,2,3,6,7,8-HxCDF	ND	48	0.13	pg/L
2,3,4,6,7,8-HxCDF	ND	48	0.13	pg/L
1,2,3,7,8,9-HxCDF	ND	48	0.16	pg/L
1,2,3,4,6,7,8-HpCDF	1.0	Q B J	0.096	pg/L
1,2,3,4,7,8,9-HpCDF	ND	48	0.13	pg/L
OCDF	1.2	Q B J	0.11	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	64	25 ~ 164
13C-1,2,3,7,8-PeCDD	65	25 ~ 181
13C-1,2,3,4,7,8-HxCDD	66	32 ~ 141
13C-1,2,3,6,7,8-HxCDD	59	28 ~ 130
13C-1,2,3,4,6,7,8-HpCDD	69	23 ~ 140
13C-OCDD	60	17 ~ 157
13C-2,3,7,8-TCDF	65	24 ~ 169
13C-1,2,3,7,8-PeCDF	66	24 ~ 185
13C-2,3,4,7,8-PeCDF	66	21 ~ 178
13C-1,2,3,4,7,8-HxCDF	65	26 ~ 152
13C-1,2,3,6,7,8-HxCDF	59	26 ~ 123
13C-2,3,4,6,7,8-HxCDF	63	28 ~ 136
13C-1,2,3,7,8,9-HxCDF	62	29 ~ 147
13C-1,2,3,4,6,7,8-HpCDF	57	28 ~ 143
13C-1,2,3,4,7,8,9-HpCDF	59	26 ~ 138
13C-OCDF	47	17 ~ 157

**TestAmerica Canton**  
**Sample ID: DAY 2 Q1 (QUENCH 1 AND 2)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I060404 - 001	Work Order #....:	M868X1AA	Matrix....:	WATER
Date Sampled....:	08/31/16	Date Received....:	09/03/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1050 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
37Cl4-2,3,7,8-TCDD	109	35 ~ 197

**QUALIFIERS**

- B Method blank contamination. The associated method blank contains the target analyte at a reportable level.
- J Estimated Result.
- Q Estimated maximum possible concentration (EMPC).

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TestAmerica Canton  
**Sample ID: DAY 2 Q2 (QUENCH 10)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I060404 - 002	Work Order #....:	M86801AA	Matrix....:	WATER
Date Sampled....:	08/31/16	Date Received....:	09/03/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1054 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		9.5	0.14	pg/L
1,2,3,7,8-PeCDD	ND		47	0.13	pg/L
1,2,3,4,7,8-HxCDD	ND		47	0.17	pg/L
1,2,3,6,7,8-HxCDD	ND		47	0.18	pg/L
1,2,3,7,8,9-HxCDD	ND		47	0.17	pg/L
1,2,3,4,6,7,8-HpCDD	ND		47	0.17	pg/L
OCDD	2.2	Q B J	95	0.25	pg/L
2,3,7,8-TCDF	ND		9.5	0.12	pg/L
1,2,3,7,8-PeCDF	ND		47	0.11	pg/L
2,3,4,7,8-PeCDF	ND		47	0.10	pg/L
1,2,3,4,7,8-HxCDF	ND		47	0.13	pg/L
1,2,3,6,7,8-HxCDF	ND		47	0.13	pg/L
2,3,4,6,7,8-HxCDF	ND		47	0.14	pg/L
1,2,3,7,8,9-HxCDF	ND		47	0.17	pg/L
1,2,3,4,6,7,8-HpCDF	0.43	Q B J	47	0.11	pg/L
1,2,3,4,7,8,9-HpCDF	ND		47	0.14	pg/L
OCDF	0.62	Q B J	95	0.11	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	64	25 - 164
13C-1,2,3,7,8-PeCDD	67	25 - 181
13C-1,2,3,4,7,8-HxCDD	69	32 - 141
13C-1,2,3,6,7,8-HxCDD	64	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	71	23 - 140
13C-OCDD	61	17 - 157
13C-2,3,7,8-TCDF	65	24 - 169
13C-1,2,3,7,8-PeCDF	68	24 - 185
13C-2,3,4,7,8-PeCDF	67	21 - 178
13C-1,2,3,4,7,8-HxCDF	67	26 - 152
13C-1,2,3,6,7,8-HxCDF	60	26 - 123
13C-2,3,4,6,7,8-HxCDF	65	28 - 136
13C-1,2,3,7,8,9-HxCDF	63	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	58	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	60	26 - 138
13C-OCDF	49	17 - 157

**TestAmerica Canton**  
**Sample ID: DAY 2 Q2 (QUENCH 10)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I060404 - 002	Work Order #....:	M86801AA	Matrix....:	WATER
Date Sampled....:	08/31/16	Date Received....:	09/03/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1054 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
37Cl4-2,3,7,8-TCDD	104	35 - 197

**QUALIFIERS**

- B Method blank contamination. The associated method blank contains the target analyte at a reportable level.
- J Estimated Result.
- Q Estimated maximum possible concentration (EMPC).

14

**TestAmerica Canton**  
**Sample ID: DAY 2 Q3 (QUENCH 20)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I060404 - 003	Work Order #....:	M86811AA	Matrix....:	WATER
Date Sampled....:	08/31/16	Date Received....:	09/03/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1057 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

PARAMETER	RESULT	MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND	9.5	0.12	pg/L
1,2,3,7,8-PeCDD	ND	47	0.12	pg/L
1,2,3,4,7,8-HxCDD	ND	47	0.20	pg/L
1,2,3,6,7,8-HxCDD	ND	47	0.20	pg/L
1,2,3,7,8,9-HxCDD	ND	47	0.19	pg/L
1,2,3,4,6,7,8-HpCDD	ND	47	0.24	pg/L
<b>OCDD</b>	<b>2.2</b>	<b>Q B J</b>	<b>95</b>	<b>0.21</b>
2,3,7,8-TCDF	ND	9.5	0.11	pg/L
1,2,3,7,8-PeCDF	ND	47	0.16	pg/L
2,3,4,7,8-PeCDF	ND	47	0.15	pg/L
1,2,3,4,7,8-HxCDF	ND	47	0.14	pg/L
1,2,3,6,7,8-HxCDF	ND	47	0.14	pg/L
2,3,4,6,7,8-HxCDF	ND	47	0.15	pg/L
1,2,3,7,8,9-HxCDF	ND	47	0.19	pg/L
1,2,3,4,6,7,8-HpCDF	ND	47	0.12	pg/L
1,2,3,4,7,8,9-HpCDF	ND	47	0.17	pg/L
<b>OCDF</b>	<b>0.49</b>	<b>Q B J</b>	<b>95</b>	<b>0.11</b>

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	69	25 - 164
13C-1,2,3,7,8-PeCDD	73	25 - 181
13C-1,2,3,4,7,8-HxCDD	72	32 - 141
13C-1,2,3,6,7,8-HxCDD	70	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	74	23 - 140
13C-OCDD	64	17 - 157
13C-2,3,7,8-TCDF	70	24 - 169
13C-1,2,3,7,8-PeCDF	73	24 - 185
13C-2,3,4,7,8-PeCDF	74	21 - 178
13C-1,2,3,4,7,8-HxCDF	73	26 - 152
13C-1,2,3,6,7,8-HxCDF	67	26 - 123
13C-2,3,4,6,7,8-HxCDF	72	28 - 136
13C-1,2,3,7,8,9-HxCDF	68	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	61	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	62	26 - 138
13C-OCDF	47	17 - 157

**TestAmerica Canton**  
**Sample ID: DAY 2 Q3 (QUENCH 20)**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I060404 - 003	Work Order #....:	M86811AA	Matrix....:	WATER
Date Sampled....:	08/31/16	Date Received....:	09/03/16	Dilution Factor:	1
Prep Date....:	09/09/16	Analysis Date....:	09/19/16		
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1057 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	103	35 - 197

**QUALIFIERS**

- B Method blank contamination. The associated method blank contains the target analyte at a reportable level.
- J Estimated Result.
- Q Estimated maximum possible concentration (EMPC).

**Method Blank Report**  
**Trace Level Organic Compounds**

Lot - Sample #....:	H6I090000 - 012B	Work Order #....:	M87P91AA	Matrix....:	WATER
Dilution Factor:	1				
Prep Date....:	09/09/16	Analysis Date....: 09/16/16			
Prep Batch # ....:	6253012				
Initial Wgt/Vol :	1000 mL	Instrument ID....:	D2A	Method:	EPA-5 1613B
Analyst ID....:	Linda K. McWhirter				

PARAMETER	RESULT		MINIMUM LEVEL	ESTIMATED DETECTION LIMIT	UNITS
2,3,7,8-TCDD	ND		10	0.11	pg/L
1,2,3,7,8-PeCDD	0.64	J	50	0.14	pg/L
1,2,3,4,7,8-HxCDD	ND		50	0.23	pg/L
1,2,3,6,7,8-HxCDD	0.67	J	50	0.26	pg/L
1,2,3,7,8,9-HxCDD	1.3	J	50	0.23	pg/L
1,2,3,4,6,7,8-HpCDD	1.9	Q J	50	0.28	pg/L
OCDD	6.6	Q J	100	0.20	pg/L
2,3,7,8-TCDF	ND		10	0.090	pg/L
1,2,3,7,8-PeCDF	ND		50	0.14	pg/L
2,3,4,7,8-PeCDF	ND		50	0.13	pg/L
1,2,3,4,7,8-HxCDF	ND		50	0.17	pg/L
1,2,3,6,7,8-HxCDF	0.99	Q J	50	0.18	pg/L
2,3,4,6,7,8-HxCDF	0.65	Q J	50	0.18	pg/L
1,2,3,7,8,9-HxCDF	1.2	J	50	0.22	pg/L
1,2,3,4,6,7,8-HpCDF	0.90	Q J	50	0.12	pg/L
1,2,3,4,7,8,9-HpCDF	1.2	J	50	0.16	pg/L
OCDF	4.8	J	100	0.14	pg/L

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	72	25 - 164
13C-1,2,3,7,8-PeCDD	73	25 - 181
13C-1,2,3,4,7,8-HxCDD	71	32 - 141
13C-1,2,3,6,7,8-HxCDD	64	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	63	23 - 140
13C-OCDD	54	17 - 157
13C-2,3,7,8-TCDF	69	24 - 169
13C-1,2,3,7,8-PeCDF	71	24 - 185
13C-2,3,4,7,8-PeCDF	71	21 - 178
13C-1,2,3,4,7,8-HxCDF	69	26 - 152
13C-1,2,3,6,7,8-HxCDF	64	26 - 123
13C-2,3,4,6,7,8-HxCDF	68	28 - 136
13C-1,2,3,7,8,9-HxCDF	68	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	58	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	63	26 - 138
13C-OCDF	47	17 - 157

**Method Blank Report****Trace Level Organic Compounds**

Lot - Sample #....: H6I090000 - 012B

Dilution Factor: 1

Prep Date....: 09/09/16

Prep Batch # ....: 6253012

Initial Wgt/Vol : 1000 mL

Analyst ID....: Linda K. McWhirter

Work Order #....: M87P91AA

Matrix....: WATER

Analysis Date....: 09/16/16

Instrument ID....: D2A

Method: EPA-5 1613B

**SURROGATE**

37Cl4-2,3,7,8-TCDD

**PERCENT  
RECOVERY**

105

**RECOVERY  
LIMITS**

35 - 197

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

Client Lot # ...: H6I060404      Work Order # ...: M87P91AC-LCS      Matrix .....: WATER  
 LCS Lot-Sample# : H6I090000 - 012  
 Prep Date .....: 09/09/16      Analysis Date ..: 09/16/16  
 Prep Batch # ...: 6253012  
 Dilution Factor : 1  
 Analyst ID.....: Linda K. McWhirter      Instrument ID.: D2A      Method....: EPA-5 1613B  
 Initial Wgt/Vol: 1000 mL

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	RECOVERY LIMITS
2,3,7,8-TCDD	200	197	pg/L	99	(67 - 158)
1,2,3,7,8-PeCDD	1000	1030	pg/L	103 B	(70 - 142)
1,2,3,4,7,8-HxCDD	1000	959	pg/L	96	(70 - 164)
1,2,3,6,7,8-HxCDD	1000	945	pg/L	95 B	(76 - 134)
1,2,3,7,8,9-HxCDD	1000	1030	pg/L	103 B	(64 - 162)
1,2,3,4,6,7,8-HpCDD	1000	940	pg/L	94 B	(70 - 140)
OCDD	2000	1770	pg/L	89 B	(78 - 144)
2,3,7,8-TCDF	200	202	pg/L	101	(75 - 158)
1,2,3,7,8-PeCDF	1000	882	pg/L	88	(80 - 134)
2,3,4,7,8-PeCDF	1000	950	pg/L	95	(68 - 160)
1,2,3,4,7,8-HxCDF	1000	981	pg/L	98	(72 - 134)
1,2,3,6,7,8-HxCDF	1000	958	pg/L	96 B	(84 - 130)
2,3,4,6,7,8-HxCDF	1000	960	pg/L	96 B	(70 - 156)
1,2,3,7,8,9-HxCDF	1000	917	pg/L	92 B	(78 - 130)
1,2,3,4,6,7,8-HpCDF	1000	967	pg/L	97 B	(82 - 122)
1,2,3,4,7,8,9-HpCDF	1000	964	pg/L	96 B	(78 - 138)
OCDF	2000	1780	pg/L	89 B	(63 - 170)

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	70	(20 - 175)
13C-1,2,3,7,8-PeCDD	71	(21 - 227)
13C-1,2,3,4,7,8-HxCDD	75	(21 - 193)
13C-1,2,3,6,7,8-HxCDD	71	(25 - 163)
13C-1,2,3,4,6,7,8-HpCDD	78	(26 - 166)
13C-OCDD	72	(13 - 199)
13C-2,3,7,8-TCDF	71	(22 - 152)
13C-1,2,3,7,8-PeCDF	75	(21 - 192)
13C-2,3,4,7,8-PeCDF	72	(13 - 328)
13C-1,2,3,4,7,8-HxCDF	74	(19 - 202)
13C-1,2,3,6,7,8-HxCDF	69	(21 - 159)
13C-2,3,4,6,7,8-HxCDF	73	(22 - 176)
13C-1,2,3,7,8,9-HxCDF	75	(17 - 205)
13C-1,2,3,4,6,7,8-HpCDF	68	(21 - 158)
13C-1,2,3,4,7,8,9-HpCDF	72	(20 - 186)
13C-OCDF	64	(13 - 199)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	107	(31 - 191)

**LABORATORY CONTROL SAMPLE DATA REPORT**  
**Trace Level Organic Compounds**

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.



## TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Log In Number:

1610b0404

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken <input type="checkbox"/> Checked in lab	
2. Were ambient air containers received intact?		/		<input type="checkbox"/> Yes <input type="checkbox"/> NA	
3. The coolers/containers custody seal if present, is it intact?		/			
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
Thermometer ID: <u>ACUJ</u> Correction factor: <u>0.0</u>					
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted <input type="checkbox"/> Sampler Not Listed on COC	
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC No tests on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC No tests on COC	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Incorrect/Incomplete	
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/				
15. Were samples received within holding time?				<input type="checkbox"/> Holding Time - Receipt	
16. Were samples received with correct chemical preservative (excluding Encore)?	/			<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative <input type="checkbox"/> Headspace (VOA only) <input type="checkbox"/> Residual Chlorine	
17. Were VOA samples received without headspace? (e.g. 1613B, 1668)					
18. Did you check for residual chlorine, if necessary?	/				
Chlorine test strip lot number: <u>lot# 1010102</u>					
19. For 1613B water samples is pH<9?	/			<input type="checkbox"/> If no, lab will adjust <input type="checkbox"/> Project missing info	
20. For rad samples was sample activity info. Provided?					
Project #: <u>62413</u>				PM Instructions: _____	
Sample Receiving Associate: <u>Naomi Johnson</u>				Date: <u>9-3-16</u>	QA026R30.doc, 080916



## TestAmerica Canton Sample Receipt Form/Narrative

Login #: 69014

## Canton Facility

Client	Environmental Quality	Site Name			Cooler unpacked by
Cooler Received on	9/2/11	Opened on	9/2/11		BM
FedEx: <input checked="" type="checkbox"/> Grd Exp	UPS FAS	Sletson	Client Drop Off	TestAmerica Courier	Other

## Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler #	Foam Box	Client Cooler	Box	Other
Packing material used:	Bubble Wrap	Foam	Plastic Bag	None Other
COOLANT:	Wet Ice	Blue Ice	Dry Ice	Water None

1. Cooler temperature upon receipt  See Multiple Cooler Form  
IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. \_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_ °C  
IR GUN #36 (CF +1.3°C) Observed Cooler Temp. \_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_ °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 3  Yes  No  
-Were custody seals on the outside of the cooler(s) signed & dated?  Yes  No NA  
-Were custody seals on the bottle(s) or bottle kits (L.LHg/MeHg)?  Yes  No
3. Shippers' packing slip attached to the cooler(s)?  Yes  No
4. Did custody papers accompany the sample(s)?  Yes  No
5. Were the custody papers relinquished & signed in the appropriate place?  Yes  No
6. Was/were the person(s) who collected the samples clearly identified on the COC?  Yes  No
7. Did all bottles arrive in good condition (Unbroken)?  Yes  No
8. Could all bottle labels be reconciled with the COC?  Yes  No
9. Were correct bottle(s) used for the test(s) indicated?  Yes  No
10. Sufficient quantity received to perform indicated analyses?  Yes  No
11. Are these work share samples?  Yes  No  
If yes, Questions 11-15 have been checked at the originating laboratory.

11. Were sample(s) at the correct pH upon receipt?  Yes  No NA pH Strip Lot# HC574756
12. Were VOAs on the COC?  Yes  No 9/2/110 BM
13. Were air bubbles >6 mm in any VOA vials?  Yes  No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 360  Yes  No
15. Was a LL Hg or Me Hg trip blank present?  Yes  No

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other

Concerning \_\_\_\_\_

## 14. CHAIN OF CUSTODY &amp; SAMPLE DISCREPANCIES

Samples processed by:

## 15. SAMPLE CONDITION

Sample(s) \_\_\_\_\_ were received after the recommended holding time had expired.  
 Sample(s) \_\_\_\_\_ were received in a broken container.  
 Sample(s) \_\_\_\_\_ were received with bubble >6 mm in diameter. (Notify PM)

## 16. SAMPLE PRESERVATION

Sample(s) \_\_\_\_\_ were further preserved in the laboratory.  
 Time preserved: \_\_\_\_\_ Preservative(s) added/Lot number(s): \_\_\_\_\_

**TestAmerica Multiple Cooler Receipt Form/Narrative  
Canton Facility**

Login #: 69014

9/2/2016

**Login Container Summary Report****240-69014**

Temperature readings: \_\_\_\_\_

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>	<u>Preservative</u>	<u>pH</u>	<u>Added (mls)</u>	<u>Lot #</u>
DAY 2 Q1 (QUENCH 1 AND 2)	240-69014-G-1	Plastic 250ml - with Sodium Hydroxide	>12	_____	_____	_____	_____
DAY 2 Q1 (QUENCH 1 AND 2)	240-69014-I-1	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
DAY 2 Q1 (QUENCH 1 AND 2)	240-69014-J-1	Plastic 500ml - with Zn Acetate and	>9	_____	_____	_____	_____
DAY 2 Q2 (QUENCH 10)	240-69014-G-2	Plastic 250ml - with Sodium Hydroxide	>12	_____	_____	_____	_____
DAY 2 Q2 (QUENCH 10)	240-69014-I-2	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
DAY 2 Q2 (QUENCH 10)	240-69014-J-2	Plastic 500ml - with Zn Acetate and	>9	_____	_____	_____	_____
DAY 2 Q3 (QUENCH 20)	240-69014-G-3	Plastic 250ml - with Sodium Hydroxide	>12	_____	_____	_____	_____
DAY 2 Q3 (QUENCH 20)	240-69014-I-3	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
DAY 2 Q3 (QUENCH 20)	240-69014-J-3	Plastic 500ml - with Zn Acetate and	>9	_____	_____	_____	_____



THE LEADER IN ENVIRONMENTAL TESTING  
Nashville, TN

## COOLER RECEIPT FORM



240-69014 Chain of Custody

Cooler Received/Opened On 9/3/2016 @ 1010

Time Samples Removed From Cooler \_\_\_\_\_ Time Samples Placed In Storage \_\_\_\_\_ (2 Hour Window)

1. Tracking # 2480 (last 4 digits, FedEx) Courier: FedEx Sat.Del.

IR Gun ID 17960353 pH Strip Lot HC58117 Chlorine Strip Lot 71130

2. Temperature of rep. sample or temp blank when opened: 0.8 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES  NO

4. Were custody seals on outside of cooler?  YES...NO...NA

If yes, how many and where: (4) Top

5. Were the seals intact, signed, and dated correctly?  YES...NO...NA

6. Were custody papers inside cooler?  YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) M3M

7. Were custody seals on containers: YES  NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES  NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # H2G

I certify that I unloaded the cooler and answered questions 7-14 (initial) H2G

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) H2G

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) H2G

I certify that I attached a label with the unique LIMS number to each container (initial) H2G

21. Were there Non-Conformance issues at login? YES  NO Was a NCM generated? YES  NO. # \_\_\_\_\_



## Login Sample Receipt Checklist

Client: Environmental Quality Mgt., Inc.

Job Number: 240-69014-1

**Login Number:** 69014

**List Number:** 2

**Creator:** Gundl, Hozar K

**List Source:** TestAmerica Nashville

**List Creation:** 09/03/16 02:35 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	